System Release 7.14

ASTRO® 25 INTEGRATED VOICE AND DATA

ASTRO 7.14 SYSTEM DOCUMENTATION OVERVIEW

November 2013

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Contact Us

Motorola Solution Support Center

The Solution Support Center (SSC) is the primary Motorola Solutions support contact. Call:

- Prior to any software reload.
- To confirm troubleshooting results and analysis prior to removing and replacing a Field Replaceable Unit (FRU) and Field Replaceable Entity (FRE) to repair the system.

For...	Phone
Domestic Calls	**800-221-7144**
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Phone Orders	**800-422-4210** (US and Canada Orders) For help identifying an item or part number: select choice 3 from the menu.
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- The document title and part number
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Document History

Version	Description	Date
6871025P24-A	Original release of the *System Documentation Overview* manual.	November 2013

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About ASTRO 7.14 System Documentation Overview

This manual provides an overview of the ASTRO® 25 documentation set. This manual is intended for use by system managers.

What Is Covered In This Manual?

This manual provides the following reference information:

- Descriptions of the ASTRO® 25 systems manuals and quick start guides.
- Visual overview of the site and subsystem configurations for ASTRO® 25 systems and ASTRO® 25 High Performance Data (HPD) systems.

Helpful Background Information

Motorola offers various courses designed to assist in learning about the system. For information, go to *http://www.motorolasolutions.com/training* to view the current course offerings and technology paths.

Related Information

See the following document for associated information about the ASTRO® system.

Related Information	Purpose
Standards and Guidelines for Communication Sites (6881089E50)	Provides standards and guidelines to follow when setting up a Motorola communications site. Also known as the *R56* manual. This manual may be purchased on CD 9880384V83 by calling the North America Parts Organization at 800-422-4210 (or the international number: 302-444-9842).

Chapter 1

ASTRO 25 System Release Documentation

This chapter provides a high-level description of customer documentation deliverables associated with the ASTRO® 25 7.14 system release.

Documentation Updates and Ordering

ASTRO® 25 system documentation is provided in electronic format at the time the system is commissioned.

The latest versions of these manuals can be downloaded from the *Motorola Online* Web site. A user account and password are required for access.

ASTRO 25 7.14 System Customer Documentation

The following table provides an alphabetical listing and describes the manuals in an ASTRO® 25 7.14 system release. The Graphical User Interface (GUI) is part of this system documentation media and provides links to this documentation based on system configurations and features. The GUI also provides a search functionality to locate content across the manuals provided.

Note: The Motorola ASTRO® 25 system manuals listed here do not provide information specific to your system implementation. Contact your system administrator for information specific to your system.

Table 1: ASTRO 25 System Documentation

Manual	Description
802.1x Service Ports on Switches	Provides information relating to the implementation and management of 802.1x standards to authenticate service users at designated Ethernet ports on HP switches and on the internal switch of GCP 8000 site controllers and GPB 8000 Reference Distribution Modules (RDMs), in an ASTRO® 25 system. This manual provides the device/port-level information.
Affiliation Display	Includes information and procedures on the use of the Affiliation Display software application to monitor the location and talkgroup affiliations of subscribers as they move within the coverage zone of an ASTRO® 25 IV&D system.
ASTRO 25 Express Standalone - Infrastructure	Provides an introduction to the ASTRO® 25 Express System Infrastructure with GTR 8000 Expandable Site Subsystem, and includes information for installing, configuring, and maintaining the site.

Table continued…

Manual	Description
ASTRO 25 Repeater Site - Infrastructure	Covers the implementation and management of an ASTRO® 25 system repeater site from a subsystem perspective. This type of subsystem employs the GTR 8000 Expandable Site Subsystem configuration.
ASTRO 25 Repeater Site with HPD Overlay	Provides information on the installation, configuration, and management of an ASTRO® 25 repeater site with HPD Overlay from the site perspective.
ASTRO 25 vCenter Application Setup and Operations Guide	Provides a description of the VMware vCenter application used to provide VMware fault tolerance and VMware high availability for virtual machines and includes process and procedures to support setup and operations for the VMware vCenter application in an ASTRO® 25 system.
ATIA Log Viewer	Includes information and procedures on the use of the ATIA Log Viewer software application to view the log files that the Air Traffic Router (ATR) and ZoneWatch applications generate. These files contain records of all recent zone activity, such as site registrations and calls processed on the ASTRO® 25 IV&D system.
Authentication Services	Provides information relating to the implementation and management of the Active Directory (AD) service, Remote Authentication Dial-In User Service (RADIUS), and Domain Name Service (DNS) in ASTRO® 25 systems.
Backup and Restore Services	Provides information relating to the implementation and management of a backup service for supported devices in an ASTRO® 25 system. This manual addresses server and client functions required for these services, and provides information relating to the implementation and replacement of the Network Attached Storage (NAS) hardware/ software component.
CAI Data Encryption Module (CDEM)	Describes data encryption services provided by the CDEM for ASTRO® 25 Conventional IV&D applications. The CAI Data Encryption Module (CDEM) is an optional component of the Conventional IV&D feature. It is located with the Conventional IV&D PDG.
Call Processing and Mobility Management	Describes at depth the behavior of various ASTRO® 25 system infrastructure components and subscriber radios as they process calls and manage subscriber mobility.
Centralized Event Logging	Provides information relating to the implementation and management of the Centralized Event Logging feature available for ASTRO® 25 systems This feature enables the capture of operating system events generated by most devices in an ASTRO® 25 system. This manual includes information about the server function and the client function required for the feature.
Channel Partitioning	Describes the implementation and management of channel partitioning on an ASTRO® 25 IV&D system.
Configuration Manager – Conventional	Covers the use of the Configuration Manager application to set Conventional System parameters for consoles, channels, and user objects.

Table continued…

Manual	Description
Configuration Manager – Trunking	Covers the use of the Configuration Manager application to set Express Trunking System parameters for subscriber radios, subscriber radio users, and talkgroups configuration objects.
Console Site Bandwidth Management	Describes the bandwidth management feature associated with operating MCC 7500 consoles in an ASTRO® 25 IV&D system. The feature ensures efficient use of resources and transport of services in your system such as voice calls and data service.
Console Sites	Describes the implementation and management of MCC console sites in an ASTRO® 25 IV&D system from a site-level perspective.
Console Systems Interoperability	Provides the information necessary to understand and manage interoperability between CENTRACOM Gold Elite and MCC 7500/7100 dispatch consoles.
Conventional Architectures for L or M Cores	Identifies and describes the Centralized Conventional Architectures and Distributed Conventional Architecture supported by a Zone Core in an ASTRO® 25 radio communication system designed to support trunking and/or conventional channel resources.
Conventional Data Services	Provides descriptive and procedural content relating to the ASTRO® 25 Conventional data feature which includes a description of the feature, a description of the role of the components supporting this feature, a description of how conventional data call processing is implemented, and how data messages are processed. Additional information provided includes procedures for installation, configuration, operation, and troubleshooting.
Conventional Operations	Provides information regarding conventional channel resource operating characteristics in standalone systems or ASTRO® 25 radio communication systems with K Series, L Series, or M Series.
Conventional System Architecture with K Core	Provides information identifying the conventional architectures of the Conventional Hub Sites and Conventional Base Radio Sites in the ASTRO® 25 Conventional and Integrated Data System supported by the K1/K2 core.
Cooperative WAN Routing	Covers the installation and management of the Cooperative WAN Routing (CWR) solution which allows core and exit routers to interface directly with site and interzone links through a patch panel installed at the ASTRO® 25 IV&D system master site.
Core Security Management Server	Provides information relating to implementation and management of basic network security software components in an ASTRO® 25 IV&D system. This manual includes server functions and client functions that support multi-factor RADIUS authentication for remote users accessing the system through a modem and terminal server. Information is also included about the server and client functions for managing system-wide anti-malware protection (including anti-virus and anti-spyware). The CSMS is also a host for the firewall management user interface (details are available in the ASTRO® 25 system *Firewall Manager* manual).
Dispatch Console Backward Compatibility Guide	Provides a list of console features supported by various ASTRO® 25 system releases. While the backward compatibility feature makes it possible to use an MCC 7500 Dispatch Console or MCC 7100 IP Dispatch Console in a system release before the system release in

Table continued…

Manual	Description
	which the console was introduced, the features available for a backward compatible console can be limited to those features identified in this manual.
Dynamic Dual Mode for TDMA Operation	Provides information describing the Dynamic Dual Mode (DDM) architecture and the TDMA (Time Division Multiple Access) technology used ASTRO® 25 systems. This information includes the use of APCO 25 Phase 2 TDMA.
Dynamic Reports	Covers the use of the Dynamic Reports software application to display usage trends and patterns of activity for effective monitoring and reporting of ASTRO® 25 IV&D system performance.
Dynamic System Resilience	Provides information necessary to understand, operate, maintain, and troubleshoot the Dynamic System Resilience (DSR) feature which may be implemented on your ASTRO® 25 system. This feature adds a geographically separate backup zone core to an existing zone core to protect against catastrophic zone core failures.
Encrypted Integrated Data	Provides information necessary to understand, install, configure, operate, maintain, and troubleshoot the Encrypted Integrated Data feature. This feature enables encryption of data calls between ASTRO® 25 subscriber units and data applications such as text messaging services that reside in the Customer Enterprise Network (CEN).
Enhanced Telephone Interconnect	Provides information describing the Enhanced Telephone Interconnect solution employing equipment supporting Voice-over-IP (VoIP) to allow individual subscriber units the ability to access the Public Switched Telephone Network (PSTN).
Fault Management - System Perspective	Provides a system-level perspective of fault management, troubleshooting, and preventive maintenance methodologies applicable to the ASTRO® 25 IV&D system.
Fire Station Alerting	Describes the implementation of the Fire Station Alerting (FSA) feature in an ASTRO® 25 IV&D system for the monitoring and management of multiple fire station facilities.
Firewall	Provides information relating to the implementation and replacement of the firewall appliances that Motorola provides, including a firewall in the DeMilitarized Zone (DMZ) between the ASTRO® 25 radio network infrastructure and a customer enterprise network (or the Motorola Solution Support Center); a firewall in the ISSI.1 Network Gateway between the ASTRO® 25 system and the ISSI.1 peer system, and a Telephony Firewall in the Enhanced Telephone Interconnect subsystem. These firewalls include the following Juniper models: SSG5, SSG140, and SSG520M. See the *Zone Core Protection* manual for details about the SSG1000 and SSG2000 firewalls used for that feature.
Firewall Manager	Provides information relating to the implementation of server software and user interface software supporting firewall management in an ASTRO® 25 IV&D system.
Fleetmapping and Band Plan Management	Describes the methodologies used to configure radio users and groups on an ASTRO® 25 IV&D system with the goal of optimizing system resources and provides an overall perspective of the system to assist

Table continued…

Manual	Description
	with Fleetmapping decisions. Also covers frequency band plan organization and management in the context of an ASTRO® 25 IV&D system.
Flexible Site and InterZone Links	Describes the Flexible Site and InterZone Links feature (also referred to as Ethernet links) that provides alternate connectivity options for linking zones and sites in a Motorola ASTRO® 25 system.
G-Series Equipment System Release Configuration	Provides information and procedures to downgrade the software of G-Series equipment (GTR 8000, GCM 8000, and GCP 8000) to meet the operating characteristic of your ASTRO® 25 system release.
GCM 8000 Comparator	Covers the installation, configuration, and management of the GCM 8000 Comparator that supports voting, multicast, and simulcast operations.
GCP 8000 Site Controller	Describes the installation, configuration, and management of the GCP 8000 Site Controller used in ASTRO® 25 circuit and IP simulcast prime sites, repeater sites, HPD sites, and conventional sites.
Generic Application Server	Covers information required to implement, maintain, and replace Generic Application Server hardware, which is based on the Sun Netra platform and is used to host the virtual server ISSI.1 Network Gateway.
GGM 8000 with IP Link Converter (IPLC) Functionality User Guide	Provides an overview of the IP Link Converter (IPLC) feature and describes how to cable, configure, and troubleshoot a GGM 8000 with IPLC functionality.
Glossary	Contains a collection of the explanations of words that express technical, or other uncommon words.
GPW 8000 Receiver	Provides information required to install, configure, and maintain the GPW 8000 Receiver that provides inbound coverage for subscriber radios that use the system. This manual includes information to install and configure the standalone GPB 8000 Reference Distribution Module (RDM) and Expansion Hub (XHub) components supporting the GPW 8000 (Trunking) Receiver. Each GPB 8000 RDM provides integrated Ethernet LAN switching and integrated site reference distribution to the GPW 8000 Receivers. The XHub component allows an RDM to support additional GPW 8000 Receivers.
GTR 8000 Base Radio	Provides information required to install, configure, and maintain the GTR 8000 Base Radio which provides the RF interface for voice, data, and control traffic transmissions between the infrastructure equipment and subscriber radios that use the system.
GTR 8000 Expandable Site Subsystem	Includes information about the GTR 8000 Expandable Site Subsystem (containing base radio, site controller, XHub, and RDM components) which provides the RF interface for voice, data, and control traffic transmissions between the infrastructure equipment and subscriber radios that use the system.
Historical Reports	Covers the use of the Historical Reports software application to generate reports that show system-wide and zone-level historical data for an ASTRO® 25 IV&D system.

Table continued…

Manual	Description
HPD – GTR 8000 Site Subsystem	Contains information required to install, configure, and manage the GTR 8000 Site Subsystem which provides the RF link between the site controller and the subscriber radios that use an HPD ASTRO® 25 system.
HPD – Packet Data Resource Management	Describes how packet data transmissions are managed in the context of the High Performance Data (HPD) feature in an ASTRO® 25 system.
HPD Overlay System - Infrastructure	Covers the implementation and management of HPD Overlay System from a high-level site perspective.
HPD Remote Site - Infrastructure	Includes site-level information required to implement and manage an ASTRO® 25 HPD remote site. This type of site provides RF coverage for subscriber units that use the High Performance Data (HPD) service.
HPD Standalone Master Site	Provides site-level implementation and management information relevant to the HPD standalone master site.
HPD Standalone System - Infrastructure	Includes high-level information required to implement and manage an ASTRO® 25 HPD standalone system. This type of site provides RF coverage for subscriber units that use the High Performance Data (HPD) service.
Information Assurance Features Overview	Provides an overview of Information Assurance features for ASTRO® 25 systems, including a description of each feature and the impact of the feature on system implementation and management. Also provides information about services available from Motorola that are related to Information Assurance, as well as physical security considerations for the ASTRO® 25 system.
InfoVista	Covers the use of the optional InfoVista application to analyze the performance of the transport network on an ASTRO® 25 system.
ISSI .1 Network Gateway	Includes information required to understand, install, manage, and troubleshoot an ISSI.1 Network Gateway Site, an interconnectivity solution for P25 ISSI.1 compatible systems.
ISSI 8000 / CSSI 8000 - Intersystem Gateway	Provides information associated with the ISSI 8000 / CSSI 8000 feature in an ASTRO® 25 system. This manual includes information to install, configure, manage, and troubleshoot the Intersystem Gateway (ISGW) server application supporting the ISSI 8000 / CSSI 8000 feature which provides an enhanced interconnectivity solution for P25 compatible systems and third-party consoles to interface with the ASTRO® 25 system.
Key Management Facility	Provides descriptive and procedural information about the Key Management Facility (KMF) including a description of where the KMF can be found, a description of KMF encryption key management, as well as procedures on installation, configuration, operation, troubleshooting, and FRU/FRE replacement.
KMF CryptR	Provides information required to install, configure, and operate the CryptR2 unit connected to the host computer for the Key Management Facility (KMF) application. This KMF CryptR unit replaces the internal Crypto Module used in previous KMF releases.

Table continued…

Manual	Description
KVL 4000 Advanced SECURENET User Guide	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the Advanced SECURENET operating mode.
KVL 4000 ASTRO 25 User Guide	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the ASTRO® 25 mode of operation.
KVL 4000 FLASHport Upgrade User Guide	Provides step-by-step instructions for upgrading the Key Variable Loader (KVL) (FLASHport). It also provides information for upgrading crypto modules of radios and other target units..
KVL 4000 Radio Authentication User Guide	Provides information associated with the use of the KVL 4000 for Radio Authentication.
Link Encryption and Authentication	Provides information relating to the implementation and management of the Router Encryption feature and Router Authentication features on ASTRO® 25 IV&D systems. Router Encryption provides a way to encrypt links between routers that traverse an untrusted network. The Router Authentication feature enables peer routers in an ASTRO® system to use pre-shared keys to authenticate messages they receive as part of the OSPF, BGP, and PIM-SIM routing protocols. This manual includes information about the encryption modules required to implement these features as well as configuration sequences that minimize downtime when adding these features to an existing system.
MAC Port Lockdown	Provides information relating to the implementation and management of MAC Port Lockdown for standard Ethernet ports on Hewlett-Packard® switches, and on the internal switch of GCP 8000 site controllers and GPB 8000 Reference Distribution Modules (RDMs), in an ASTRO® 25 system. Also provides information required for supplemental Ethernet port security, including the implementation of fiber optic ports on Hewlett-Packard® switches.
Master Site - Infrastructure	Covers site-level information required to install and maintain equipment at the ASTRO® 25 IV&D system master site.
MCC 7100 IP Dispatch Console Setup and User Guide	Provides a setup and user guide for the MCC 7100 IP Dispatch Console (software only) feature. This manual provides a description of the MCC 7100 IP Dispatch Console position which can be installed on a personal computer client machine, and it provides a description of the MCC 7100 software-based dispatch console position along with the requirements and considerations necessary for implementing this feature in an ASTRO® 25 system.
MCC 7500 Dispatch Console with Voice Processor Module	Describes site-level characteristics of VPM-based Console Dispatch sites including theory of operation, installation, and configuration for hardware and software, operation, maintenance, and troubleshooting information.
MCC 7500/7100 Elite Admin User's Guide	Provides administrators with information required to configure and administer the MCC 7500 Elite Dispatch software application to

Table continued…

Manual	Description
	enable communication paths between dispatch console operators and radio system resources.
MCC 7500/7100 Elite Dispatch User's Guide	Provides user guide information intended for dispatch console operators. This manual describes how to use the MCC 7500 Elite Dispatch software application.
MKM 7000 Console Alias Manager	Provides information required to install, configure, and operate the MKM 7000 Console Alias Manager (CAM) solution for generating and managing aliases at the console site level.
MLC 8000 Comparator	Provides information required to install, configure, manage, and operate the MLC 8000 hardware device which is used as an analog conventional comparator/voter (for analog IP simulcast and non-simulcast voting) and as a subsite link converter. The MLC 8000 facilitates conventional mixed mode conventional channels.
MLC 8000 Configuration Tool with Analog Display and Control	Provides information about software used for configuration, analog voting display, and analog voting control for the MLC 8000 device, which is used as an analog conventional comparator/voter for analog IP-based simulcast and non-simulcast voting, and as a subsite link converter for conventional analog, digital, and mixed mode channels.
Module de traitement de la voix	French version of the *Voice Processor Module* manual. Décrit les composants du module de traitement de la voix et leurs fonctions.
MOSCAD Network Fault Management	Provides information required to install, configure, manage, and use the MOSCAD® Network Fault Management (NFM), an optional ASTRO® 25 IV&D solution that provides tools to configure, monitor, and control auxiliary system devices (such as tower lights, power, and environmental equipment) in communication sites.
Network Time Protocol Server	Provides information about the installation, configuration, and management of components that comprises the TRAK 9100 Network Time Protocol (NTP) server, an option supplied with the Simulcast Site Reference (SSR) that serves a time synchronization function for clients in an Ethernet network.
Packet Data Gateways	Covers the installation, configuration, and management of the IV&D Packet Data Gateway (PDG) and its components, namely the Packet Data Router (PDR) and the Radio Network Gateway (RNG).
PDEG Encryption Unit	Provides information on the PDEG Encryption Unit hardware, which is a component of the Encrypted Integrated Data (EID) feature and is located within the Customer Enterprise Network (CEN). The EID feature provides data encryption services for dedicated ASTRO® 25 Trunked Integrated Voice and Data applications between the CEN and subscriber radios.
Performance Management - System Perspective	Provides a high-level perspective of the tools and methodologies that can be used to manage the overall performance of an ASTRO® 25 IV&D system.
Private Network Management Client	Describes how to install, configure, and manage the Private Network Management client, a PC workstation which system administrators and technicians use for various system-related tasks such as viewing equipment operational status, monitoring network utilization and performance, or viewing alarms generated by system equipment.

Table continued…

Manual	Description
Private Network Management Servers	Provides information on the installation, configuration, and management of the Private Network Management (PNM) servers, namely, Air Traffic Router (ATR), Unified Event Manager (UEM), Zone Database Server (ZDS), System Statistical Server (SSS), and Zone Statistical Server (ZSS).
Provisioning Manager	Provides a description of the Provisioning Manager server application. Includes information to tailor this application for system use and contains information to provision your ASTRO® 25 radio communication system with various system-level, user-level, and device-level configuration parameters required for proper system operation. This manual also includes reference and troubleshooting information to ensure efficient and effective use of this application.
Provisioning Manager Interface - Developer Guide	Provides an operational description of the ASTRO® 25 Provisioning Manager Interface, and contains information to support development of applications designed to import and/or export subscriber configuration data into and out of the Provisioning Manager application using an API (Application Programming Interface) and/or CSV (Comma Separated Value) files. The API provides third-party solution vendors (such as Asset Management solutions, CAD, and Fleetmapping, and so on) with the ability to integrate their application(s) with Provisioning Manager to keep information across systems in sync. With the Provisioning Manager Interface, data can be imported and/or exported in the form of spreadsheets that can be modified with common-off-the-shelf software applications.
Radio Authentication	Provides information to support customers who purchased radio authentication as part of the ASTRO® 25 system. This manual provides a description of the feature, a description of the hardware and software supporting this feature, as well as installation and configuration processes, operation procedures, troubleshooting, and maintenance information.
Radio Control Manager	Includes information and procedures on the use of the Radio Control Manager (RCM) application to monitor radio events, issue and monitor commands, and make informational queries of system status.
Radio Control Manager Reports	Provides a high-level description of the Radio Control Manager (RCM) Report features and the function it serves on your system.
Radio Features	Includes the information and procedures required to configure subscribers to operate on the ASTRO® 25 IV&D system.
Secure Communications - System Perspective	Provides descriptive information about the Secure Communications features found in an ASTRO® 25 Trunked and Conventional Integrated Voice and Data and ASTRO® 25 Conventional and Integrated Data systems. This manual is intended to be used by technicians and system operators as a resource for understanding secure communications in ASTRO® systems. The manual should be used with the ASTRO® 25 system documentation and *Key Management Facility* manual.
Securing Protocols with SSH	Provides information relating to the implementation and management of the Secure SHell (SSH) protocol for secure transmission of data between devices in an ASTRO® 25 system. Includes configuration

Table continued…

Manual	Description
	sequences that minimize downtime when adding this feature to a system that is already in operation.
Service Access Architecture	Provides information relating to the implementation of a secure connection between a service technician's laptop and the ASTRO® 25 IV&D system. Examples of access scenarios are also provided.
Simulcast Site Reference	Provides information relating to the implementation and management of components for the Simulcast Site Reference (SSR) and Global Positioning System (GPS) receiver that provides the required time reference for simulcast subsystems in ASTRO® 25 systems.
Simulcast Subsystem with HPD Overlay	Covers the installation, configuration, and management of an ASTRO® 25 Simulcast Subsystem, with HPD Overlay from the site perspective.
SmartX Site Converter	Describes the interface between SmartZone®, OmniLink, and SMARTNET® 3600 systems and the ASTRO® 25 system. Includes descriptions of system configurations, theory of operation, installation, configuration, operation, maintenance, troubleshooting, and hardware replacement for the Voice Processor Module (VPM) hardware when used as a site converter.
SNMPv3	Provides information relating to the implementation and management of the SNMPv3 protocol in an ASTRO® 25 IV&D system. Simple Network Management Protocol (SNMP) is a set of protocols used for managing complex networks.
Software Download Manager	Covers the use of the Software Download Manager (SWDL) application to download firmware to site equipment individually or via download to all site devices as part of a single operation. This document also supports ASTRO® Express single-site trunking.
Summit Depot Service Manual VHF	Provides service-level documentation for summit-based equipment.
Summit Depot UHF R2 & R1 Service Manual	Provides service-level documentation for summit-based equipment.
System Documentation Overview	Describes the volumes and manuals that comprise the ASTRO® 25 IV&D system documentation set and includes system diagrams.
System Gateways - GGM 8000	Provides information relating to the installation, configuration, and management of the GGM 8000 Gateway as used at in various network locations.
System LAN Switches	Provides use of Hewlett-Packard® (HP) switches in ASTRO® 25 systems, including LAN switches and backhaul switches. In addition to common procedures for installation, configuration, operation, and troubleshooting of the switches, this manual provides information for specific ASTRO® 25 system sites and features that HP switches can support.
System Level Disaster Recovery	Provides a general guideline for implementing system-level disaster recovery process for RF site recovery, master site (zone core) recovery, and dispatch console site recovery in an ASTRO® 25 system.

Table continued…

Manual	Description
System Profile and Zone Profile	Covers the use of the Zone and System Profile applications to track application usage at the zone and system level in an ASTRO® 25 IV&D system.
System Routers - S6000/S2500	Provides information relating to the installation, configuration, and management of the S6000 and S2500 routers as used in various network locations.
Terminal Servers LX Series	Covers installation, configuration, and management of the In-Reach® 8000 (LX-4000S) series Terminal Server which supports a network management connection to servers and network transport equipment in the zone.
Trunked Data Services	Describes the implementation and use of data services on ASTRO® 25 systems, specific to the Classic Data (IV&D) and Enhanced Data functionality, and the High Availability for Trunked IV&D and HPD feature.
Trunked IP Simulcast Subsystem - Infrastructure	Covers the implementation and management of ASTRO® 25 trunked system IP simulcast prime and remote sites from a subsystem perspective. This type of subsystem employs GTR 8000 Base Radios or the GTR 8000 Expandable Site Subsystem.
Trunked IP Simulcast Subsystem Prime Site	Covers the installation, configuration, and management of an ASTRO® 25 trunked system IP simulcast prime site employing the GCP 8000 Site Controller and GCM 8000 Comparator.
Trunked IP Simulcast Subsystem Remote Site	Covers the installation, configuration, and management of an ASTRO® 25 trunked system IP simulcast remote site employing GTR 8000 Base Radios or the GTR 8000 Expandable Site Subsystem.
Unified Event Manager	Covers the use of Unified Event Manager (UEM), the application that provides reliable fault management services for devices in the ASTRO® 25 IV&D radio system.
Unified Network Configurator	Covers the use of Unified Network Configurator (UNC), a sophisticated network configuration tool that provides controlled and validated configuration management for system devices including routers, LAN switches, site controllers, and base radios, and is used to set up sites for the ASTRO® 25 IV&D system. UNC has two components: VoyenceControl and Unified Network Configurator Wizards (UNCW).
Unix Supplemental Configuration	Provides additional procedures that an organization may require for Solaris™-based and Linux-based devices, including procedures for configuring password aging, and welcome banners.
Virtual Management Server Hardware	Provides information for implementing, maintaining, and replacing common Hewlett-Packard® hardware for servers in an ASTRO® 25 system.
Virtual Management Server Software	Provides procedures for implementing and managing VMware ESXi-based virtual server hosts on the common Hewlett-Packard® hardware platform in an ASTRO® 25 system. Includes common procedures for virtual machines/virtual appliances on the virtual server host.
Voice Processor Module	Describes the hardware that serves as the foundation for the Voice Processor Module (VPM) used in MCC 7500 console subsystem, the

Table continued…

Manual	Description
	SmartX Site Converter at remote sites, and the Telephone Media Gateway (TMG) in the zone core for the Enhanced Telephone Interconnect subsystem. Includes descriptions, theory of operation, installation, and configuration for hardware and software, operation, maintenance, troubleshooting, and component replacement.
Vote Scan Feature - Supplement for ASTRO Conventional Systems	Introduces the subscriber vote scan feature and describes how it can be implemented for use on ASTRO® Conventional multicast systems. The intended audiences for this document include system managers who want to familiarize themselves with the vote scan feature, and system technicians and administrators who implement or administer this feature on an ASTRO® Conventional System. This guide assumes that the user has a thorough understanding of ASTRO® Conventional Systems concepts and topologies, and is experienced implementing and/or configuring such systems.
Windows PC Recovery for K System	Provides instructions for restoring various Windows®-based components used in a system with a K1 or K2 core, and lists common errors to avoid.
Windows Supplemental Configuration	Provides additional procedures that must be performed on all Windows®-based devices in an ASTRO® 25 system, and additional procedures that are performed only for specific Windows®-based devices.
Zone Controller	Covers the zone controller, a key component of the ASTRO® 25 system master site. Includes information on the installation, configuration, and management of this software application.
Zone Core Protection - Infrastructure	Provides information relating to the implementation and management of the Zone Core Protection (ZCP) feature available for ASTRO® 25 IV&D systems. ZCP is an optional configuration of hardware and software components for supporting network security at the zone core (master site). ZCP-specific components covered in this manual include ZCP firewalls, Mediation LAN switches, and a Motorola-supplied intrusion detection solution.
ZoneWatch	Covers the use of the ZoneWatch software application to monitor call processing resource assignments at sites in an ASTRO® 25 IV&D system.

ASTRO 25 7.14 System Quick Start Guides

The following table describes the customer documentation reference guides provided to assist in the installation of hardware in an ASTRO® 25 system release.

Table 2: ASTRO® 25 System Customer Documentation – Quick Start Guides

Title	Description
ASTRO 25 Express Quick Start Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment in the ASTRO® 25 Express System.

Table continued…

Title	Description
ASTRO 25 Express Upgrade - Quick Start Guide	Documents the overall strategy and process for upgrading an ASTRO® 25 Express System.
CSS Getting Started Guide	Provides Instructions for CSS installation and setup.
K1/K2 Core Quick Start Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the K1/K2 core for the ASTRO® 25 Conventional & Integrated Data System.
K1/K2 Remote Site Quick Start Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the remote sites in an ASTRO® 25 Conventional & Integrated Data System.
K1/K2 Upgrade Quick Start Guide	Outlines and summarizes the overall strategy and process for upgrading an ASTRO® 25 K1/K2 Core System.
KVL 4000 Quick Start Guide	Provides basic information on the use of the KVL 4000.
L1/L2 Core Quick Start Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the zone core of an ASTRO® 25 L1/L2 Express System.
L1/L2 Remote Site Quick Start Guide	Lists setup, test, and verification activities for the essential equipment at the remote site of an ASTRO® 25 L1/L2 Express System.
MCC 7500 Dispatch Console/AIS with VPM – Installation and Configuration Quick Start Guide	Describes the process and procedures needed to install and configure a MCC 7500 Dispatch Console and a MCC 7500 AIS
Quick Guide for Implementing MLC 8000s	Provides site-level information and sequences for implementing the MLC 8000 device which is used as an analog conventional comparator/voter for analog IP-based simulcast and non-simulcast voting, and as a subsite link converter for conventional analog, digital, and mixed mode channels.
Quick Guide for Replacing a Conventional QUANTAR with a GTR 8000 Base Radio	Provides instructions for replacing conventional QUANTAR® base radios with conventional analog, digital, and mixed mode GTR 8000 base radios. Also provides detailed comparisons of the devices.

Chapter 2

ASTRO 25 System Diagrams

This chapter provides a visual overview of site and subsystem configurations for ASTRO® 25 systems and ASTRO® 25 High Performance Data (HPD) systems.

Note:

The system diagrams included here do not provide details on the many possibilities for RF site topologies in ASTRO® 25 systems. For detailed information on trunked RF sites, see the site manuals listed in the previous chapter. For examples of conventional site topologies and an overview of conventional devices and documentation, see the *Conventional Operations* manual.

These diagrams do not show the TRAK Network Time Protocol server at core sites. Details are available in the *Network Time Protocol Server* manual.

ASTRO 25 7.14 System Diagrams Overview

The following pages provide a visual overview of the following system, site, and subsystem configurations for the 7.14 release of the ASTRO® 25 systems and ASTRO® 25 High Performance Data (HPD) systems.

Note: System diagrams included in this document show T1/E1 links between sites and zones. An optional flexible site and InterZone links feature facilitates Ethernet backbone link implementation between select site types and between zones. For more information, see the *Flexible Site and InterZone Links* manual in this documentation set. Also, see the *Dynamic System Resilience* manual for advanced illustrations and additional configurations if your system has this feature.

Figure 1: ASTRO 25 Integrated Voice and Data Trunked System

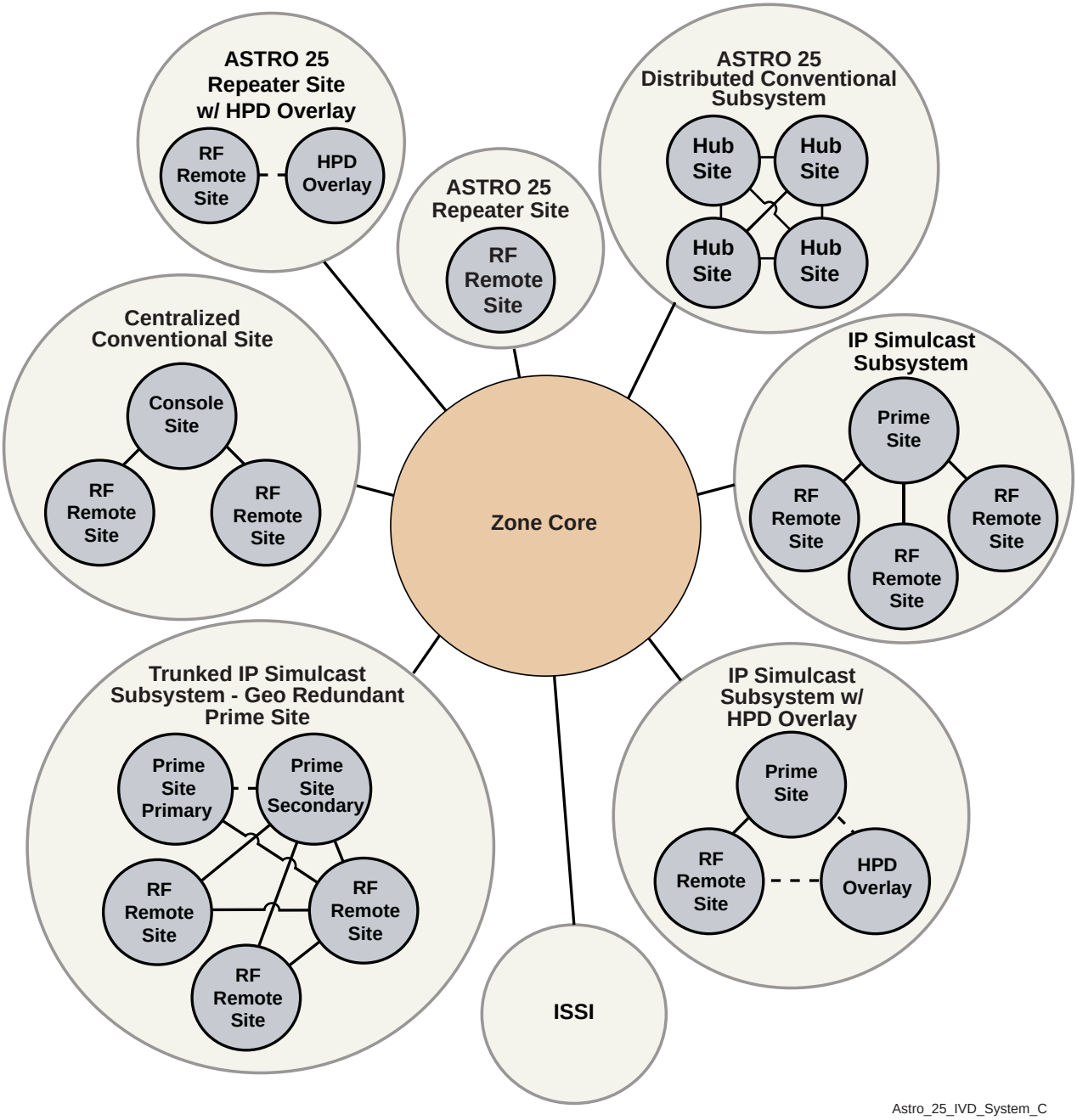


Figure 2: ASTRO 25 – Single Zone Small Scale Non-Redundant Zone Core (L1)

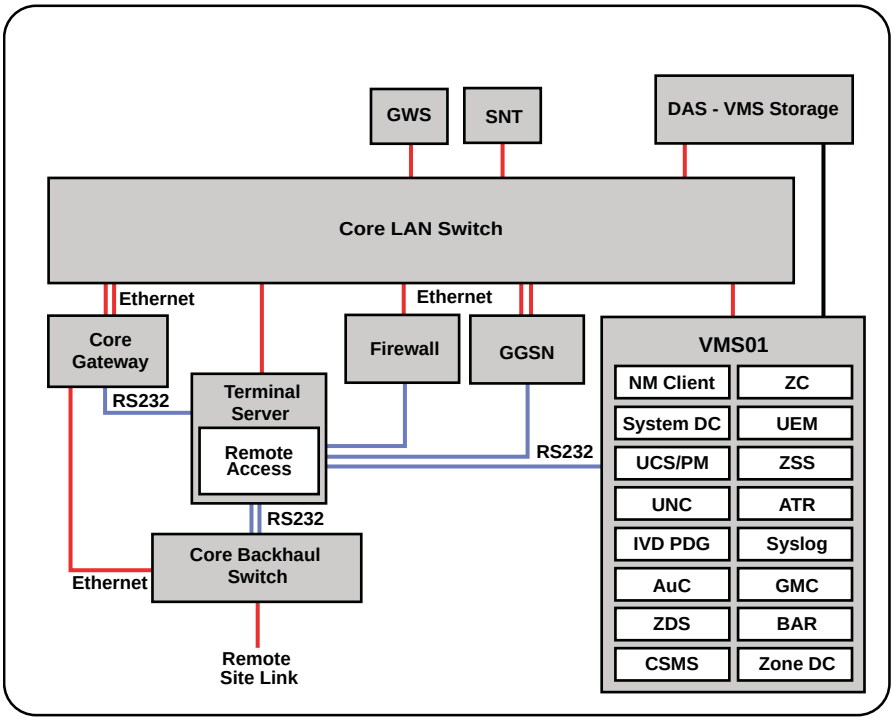


Figure 3: ASTRO 25 – Single Zone Small Scale Redundant Zone Core (L2)

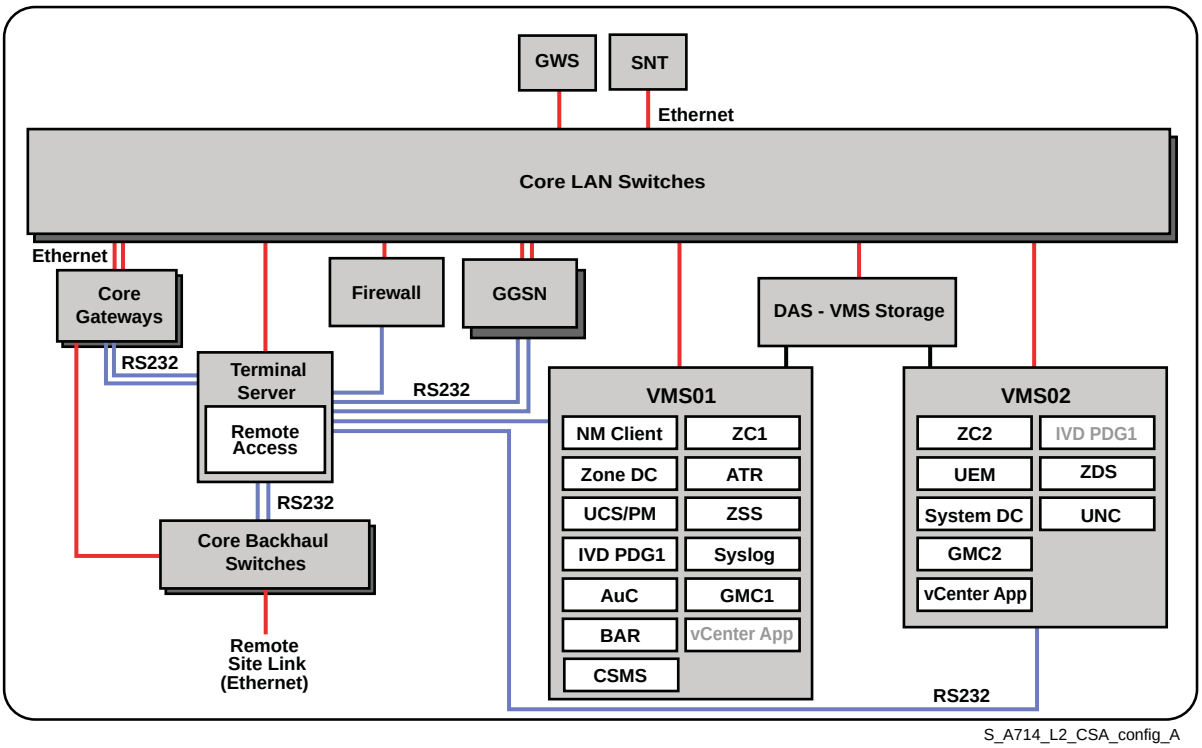
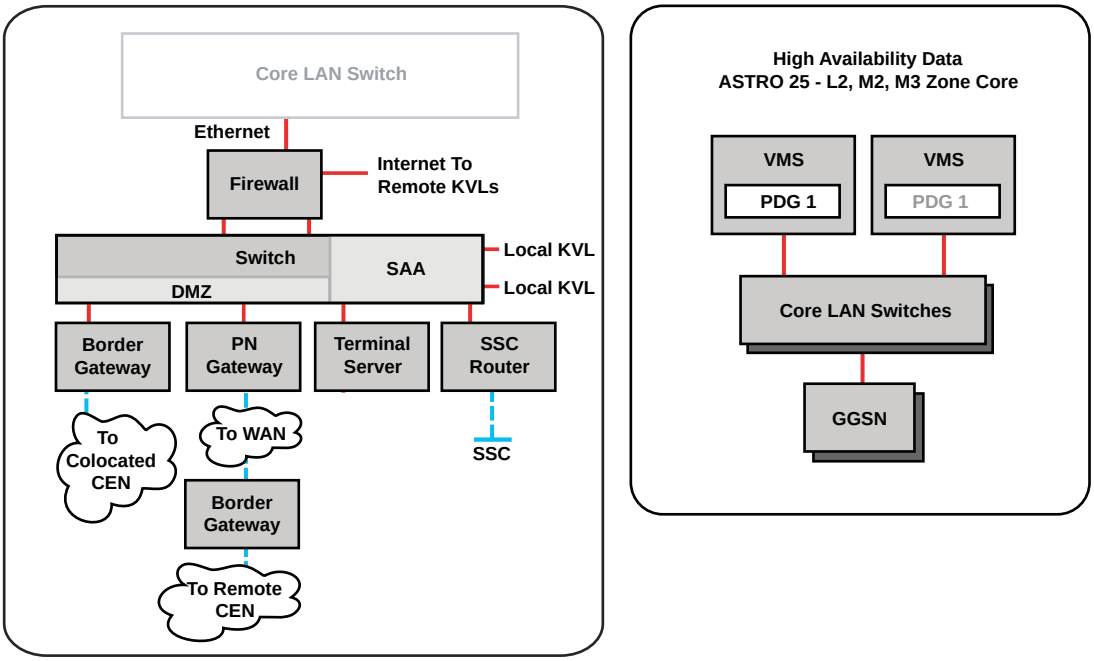
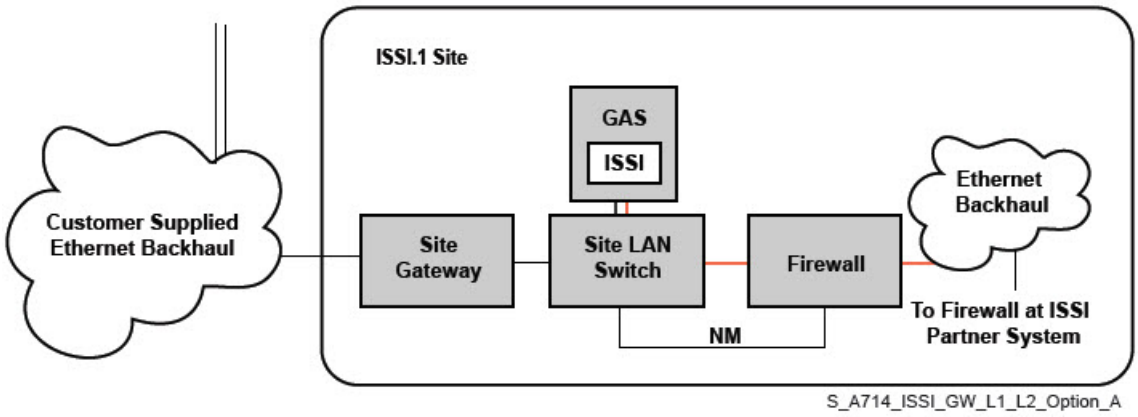


Figure 4: Zone Core (L1/L2) Options



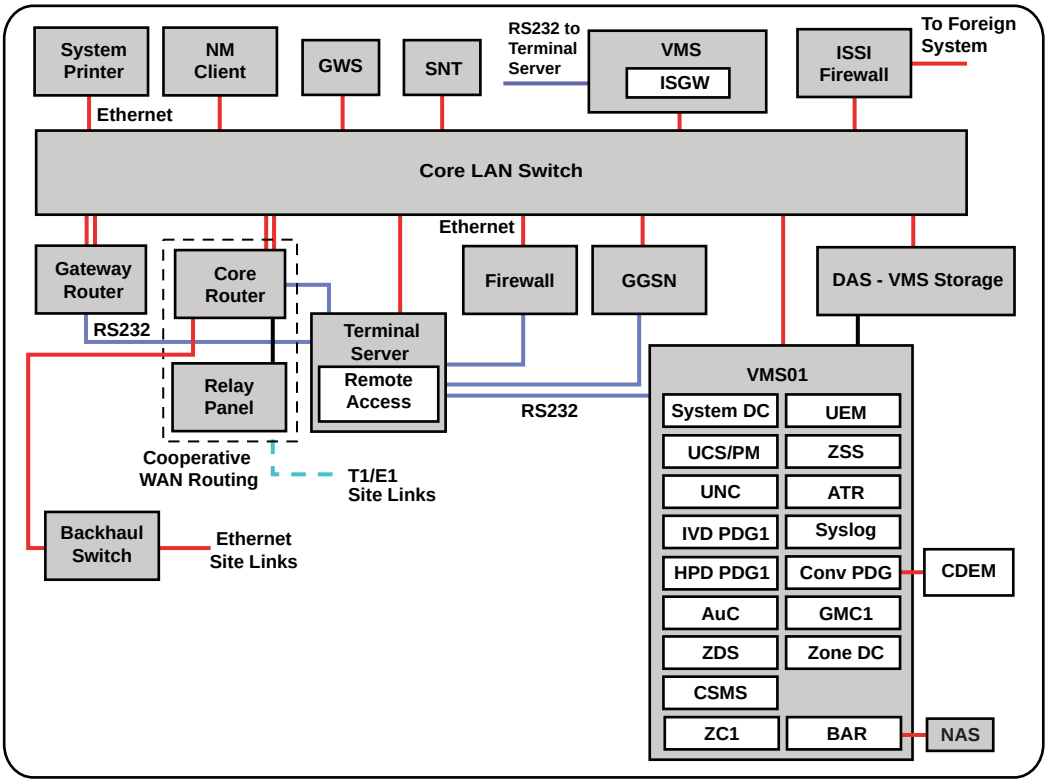
S_L1_L2_Zone_Core_Options_D

Figure 5: ISSI.1 Gateway (L1/L2) Option



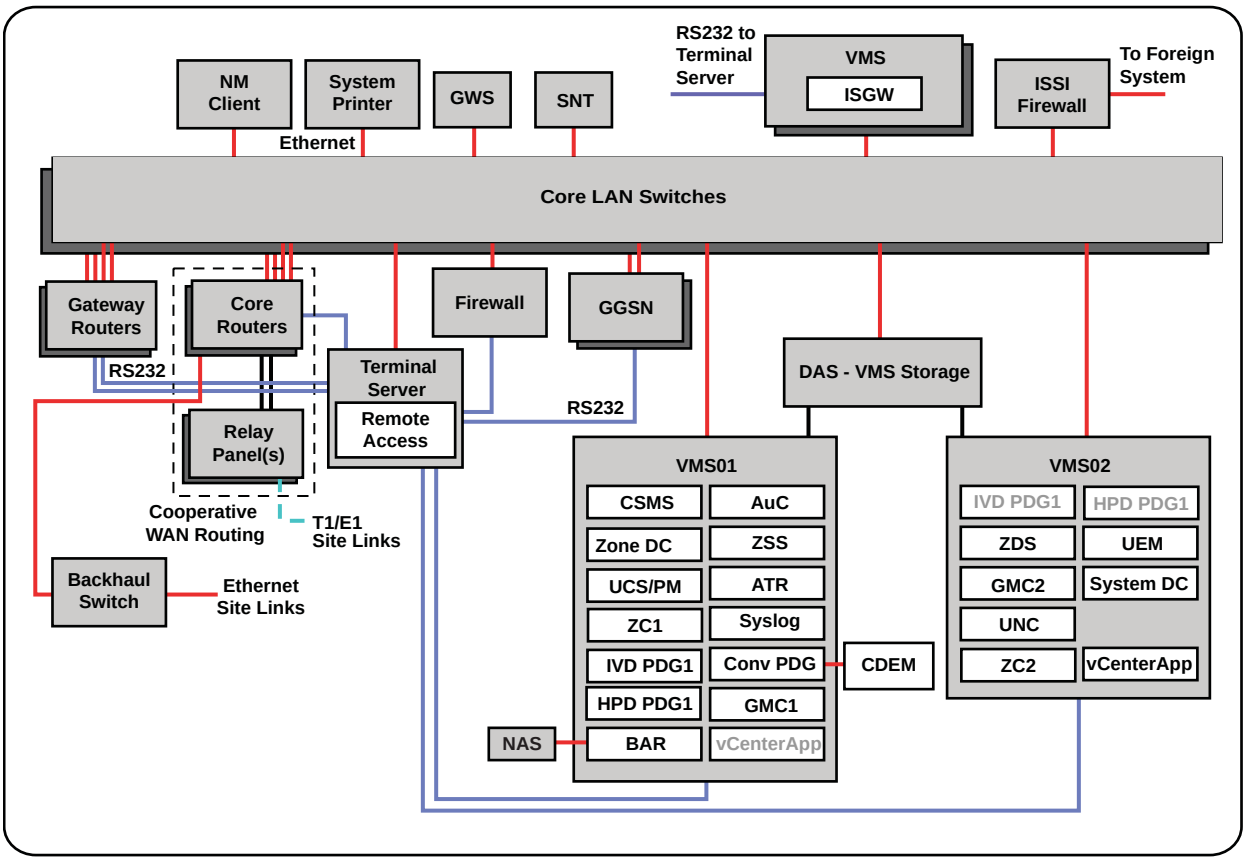
S_A714_ISSI_GW_L1_L2_Option_A

Figure 6: Single Zone Non-Redundant Zone Core (M1)



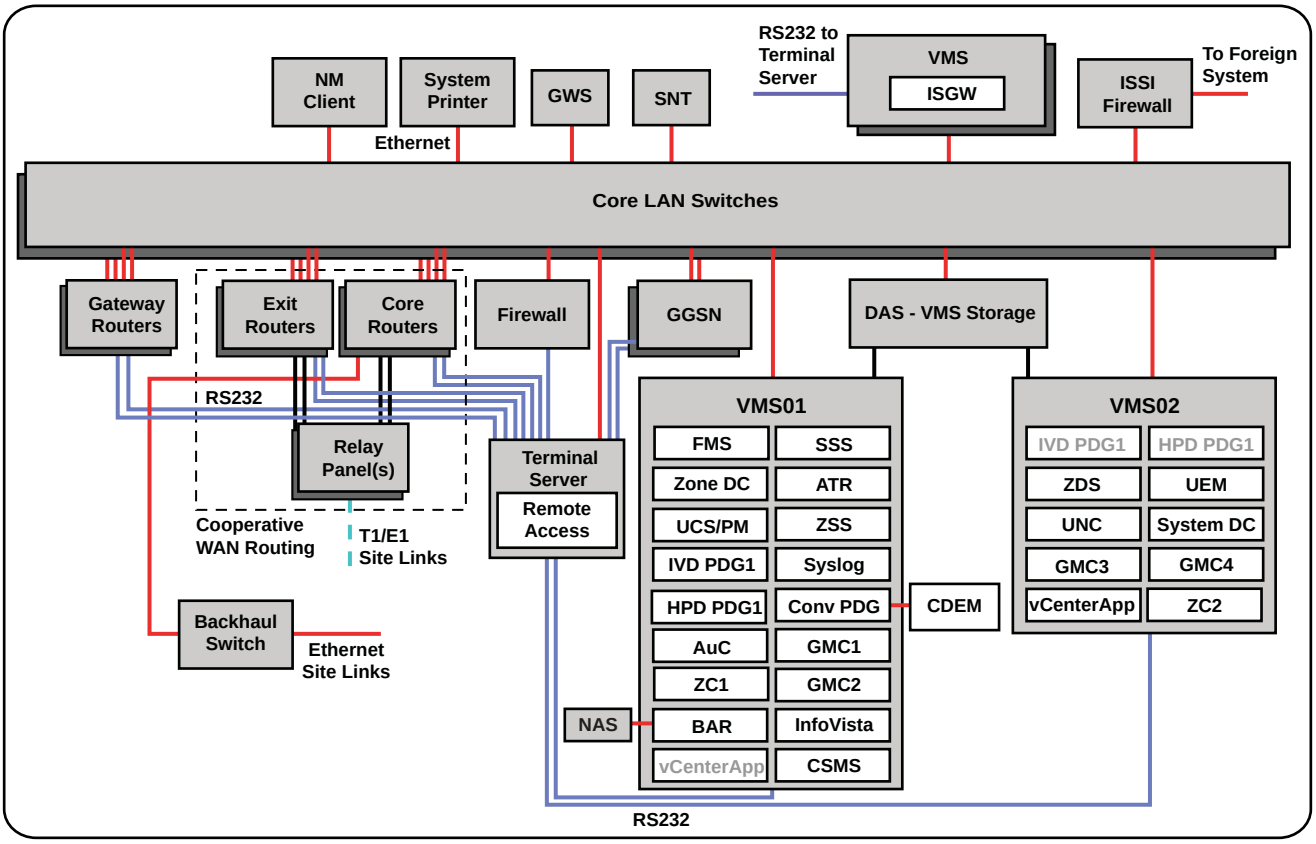
S_A714_M1_Core_config_A

Figure 7: Single Zone Redundant Zone Core (M2)



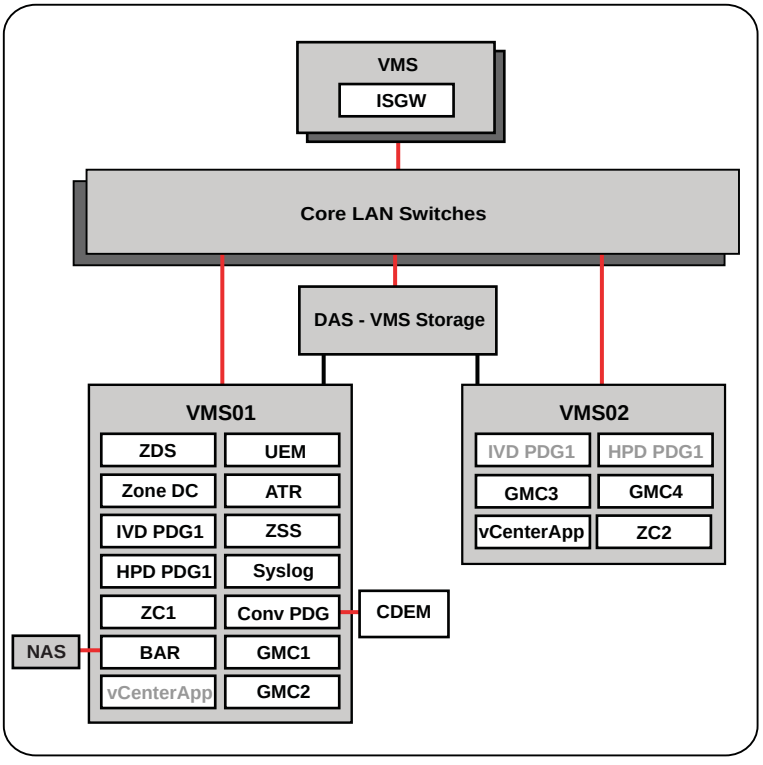
S_A714_M2_Core_Config_B

Figure 8: Multi-Zone Capable Zone Core (M3)



S_A714_M3_Primary_System_Zone_Core_Config_B

Figure 9: Add-On Zone Core (M3)



S_A714_M3_Add_on_Core_CSA_config_B

Figure 10: Multi-Zone Capable Zone Core (M3) with ZCP and HPD

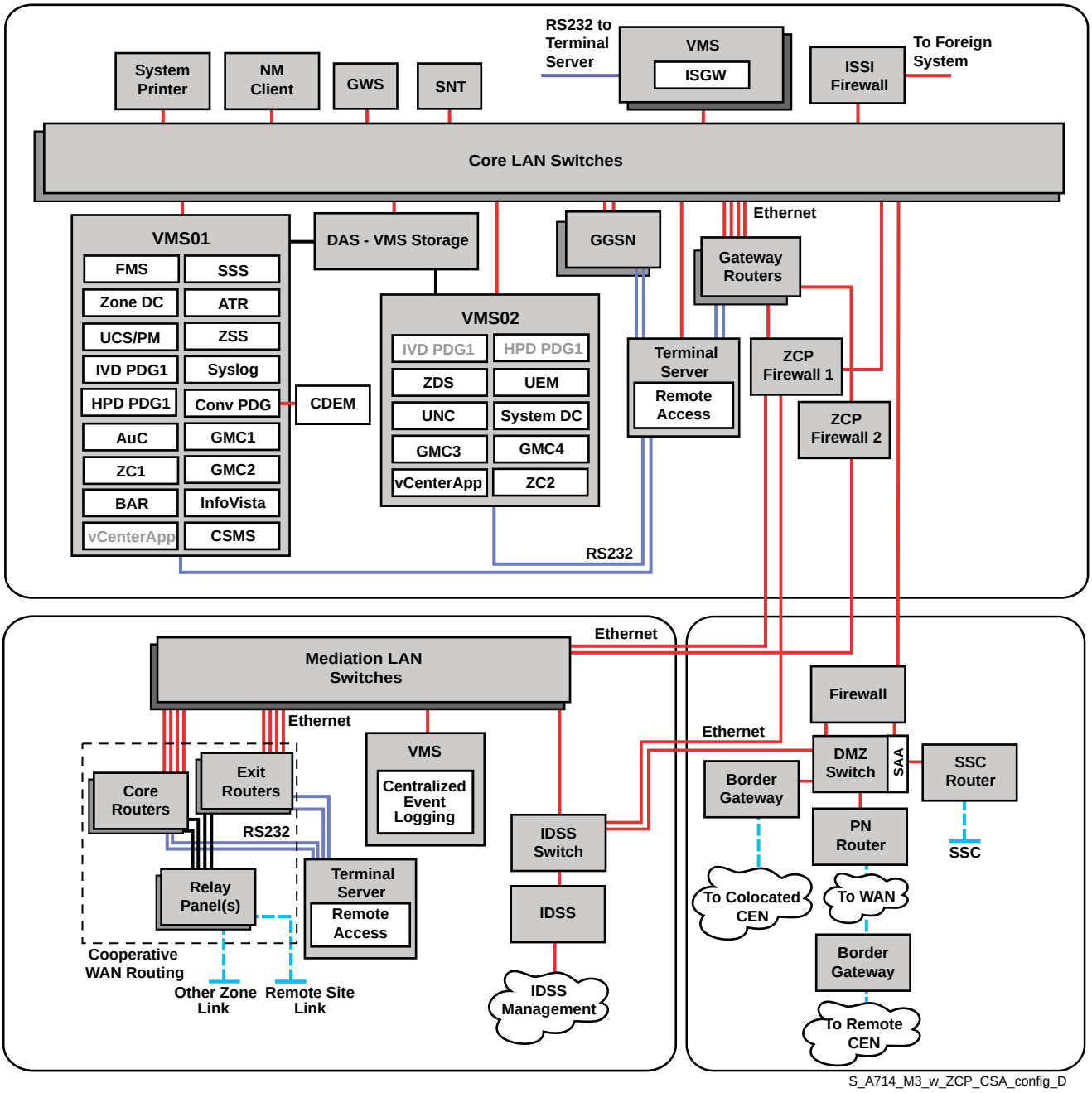


Figure 11: Multi-Zone Capable System - DSR/Non-DSR Zone Cores

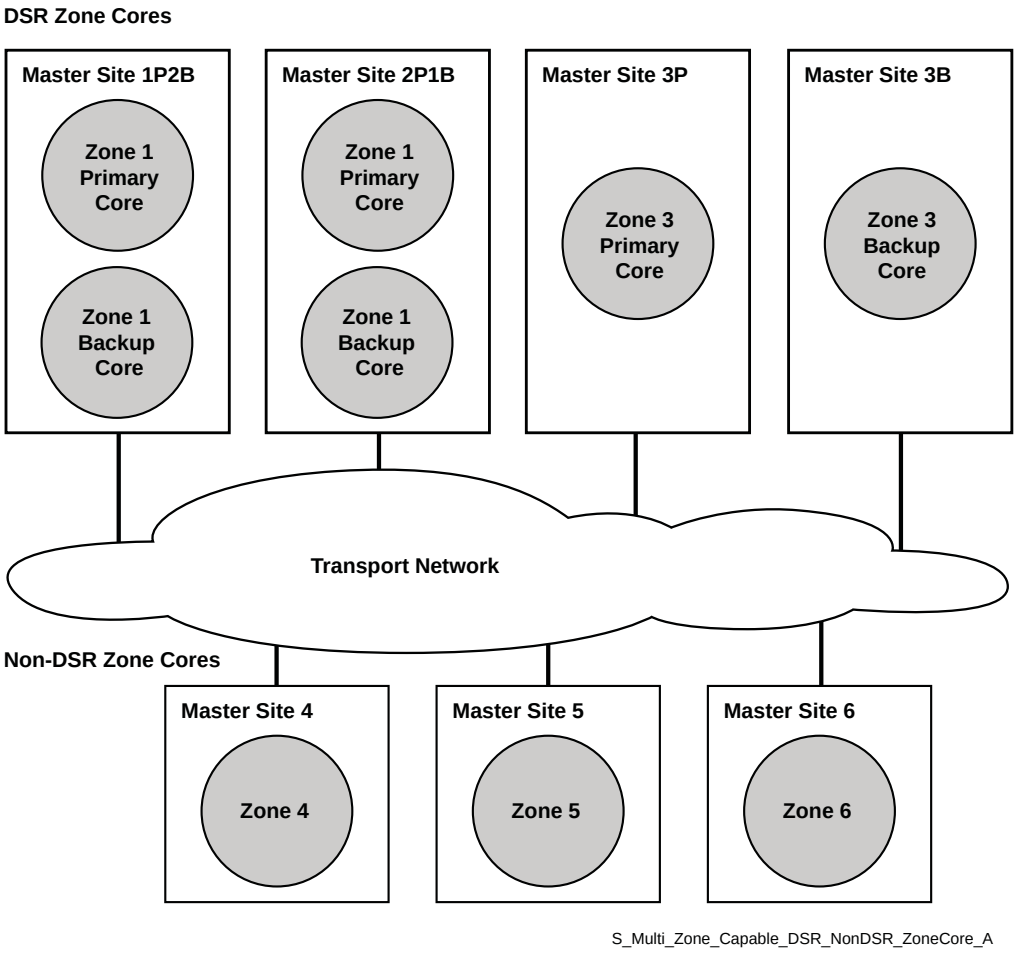
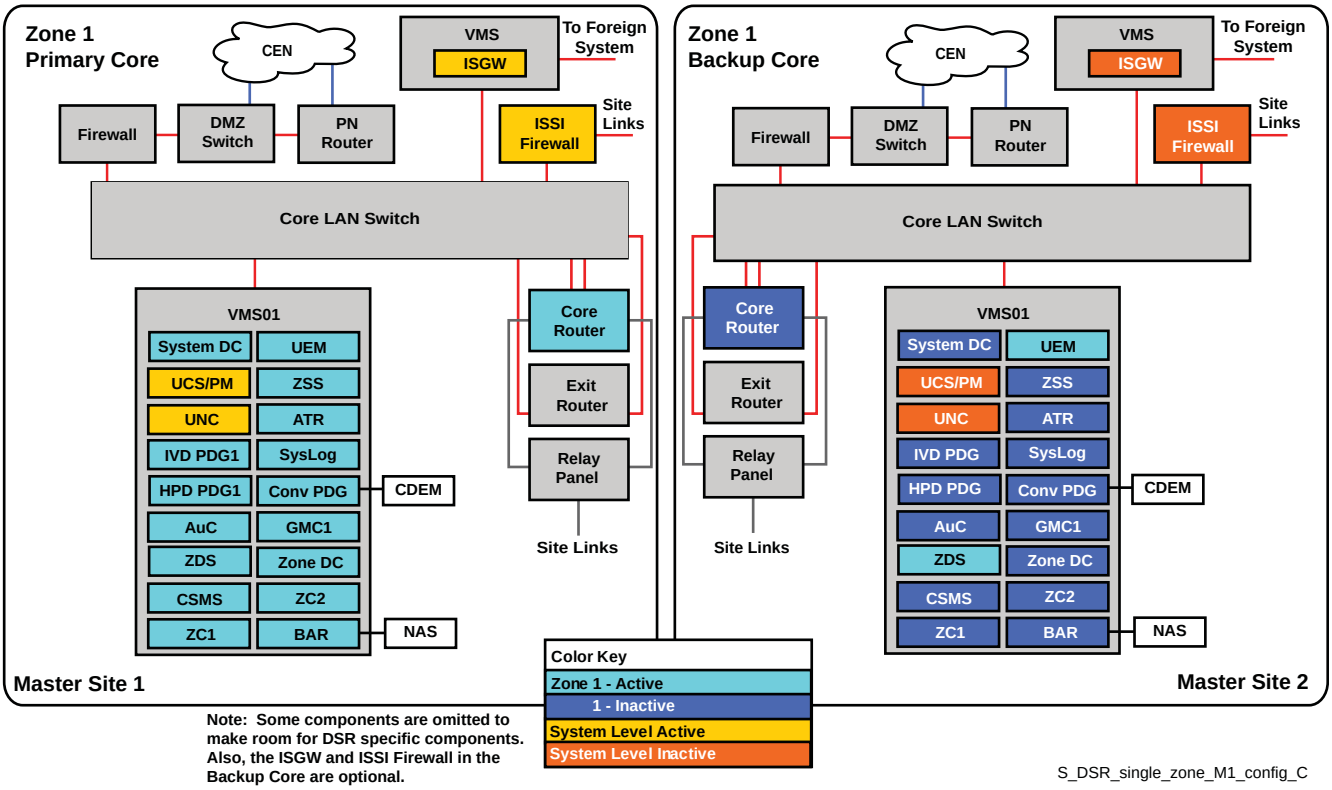


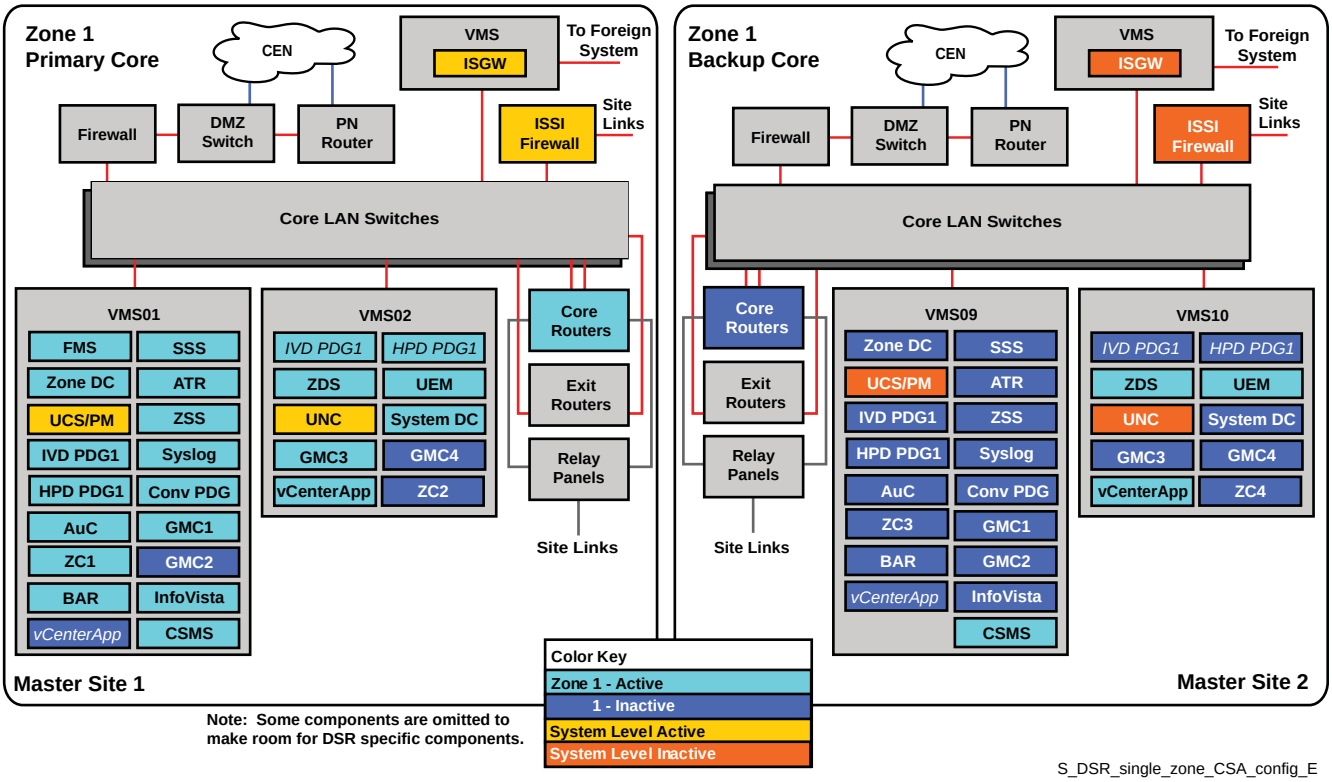
Figure 12: Dynamic System Resilience — Single Zone Non-Redundant



Note: Some components are omitted to make room for DSR specific components. Also, the ISGW and ISSI Firewall in the Backup Core are optional.

S_DSR_single_zone_M1_config_C

Figure 13: Dynamic System Resilience — Single Zone Redundant



Note: Some components are omitted to make room for DSR specific components.

S_DSR_single_zone_CSA_config_E

Figure 14: Dynamic System Resilience — Dual Zone

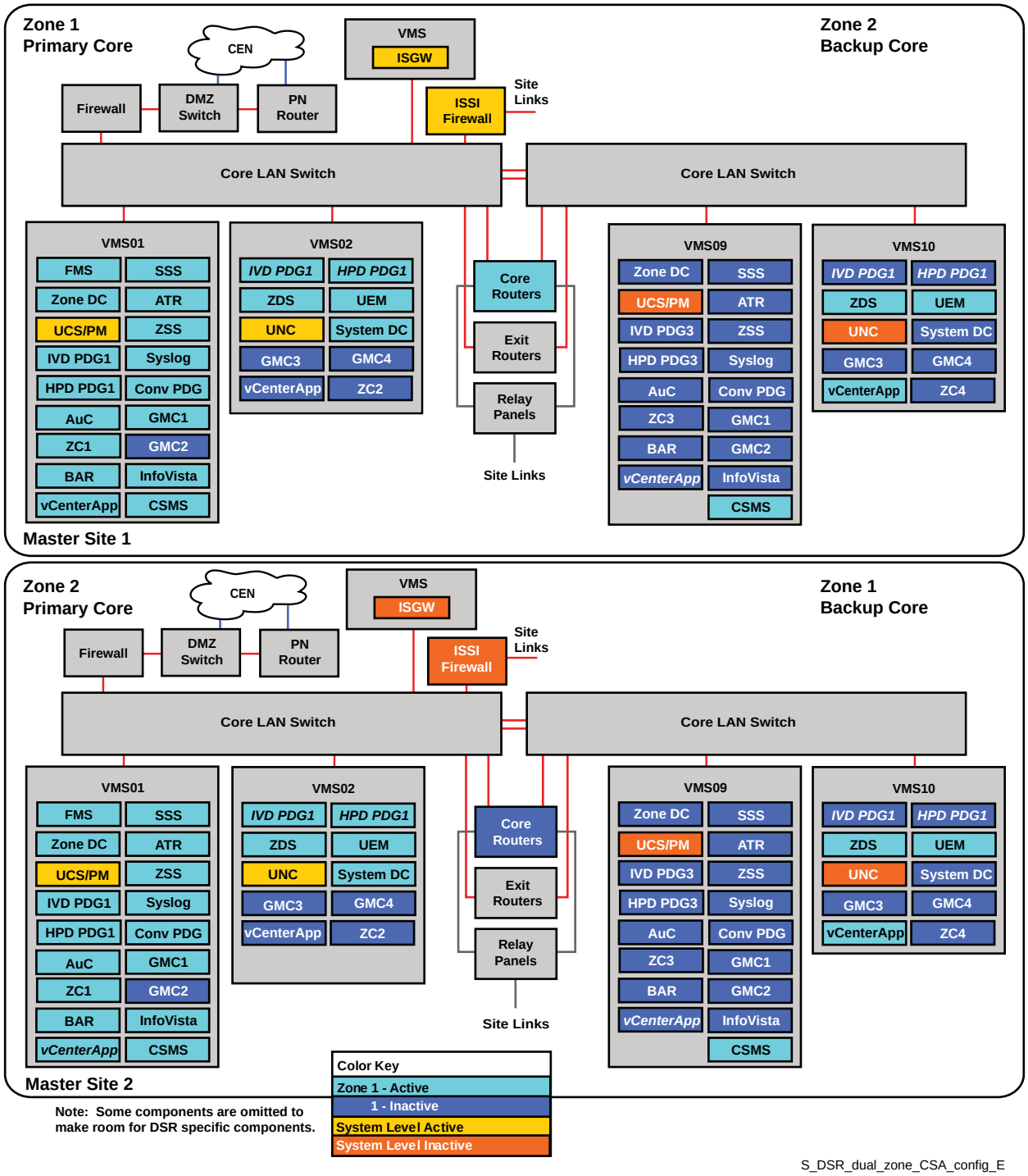


Figure 15: Zone Core (M1/M2/M3) Options

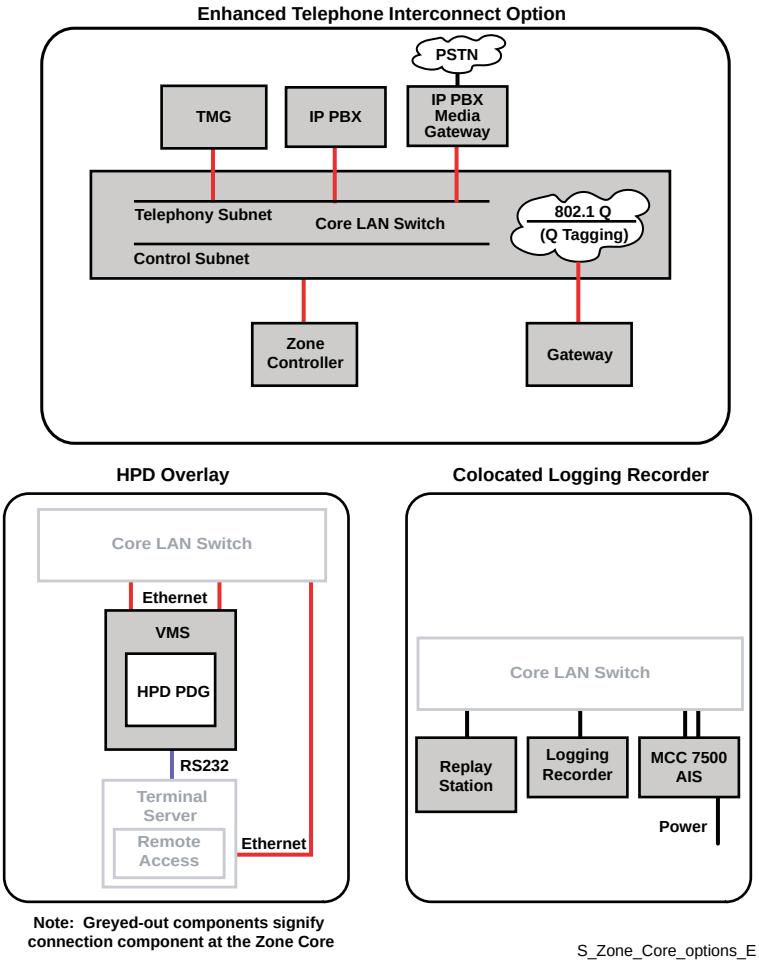
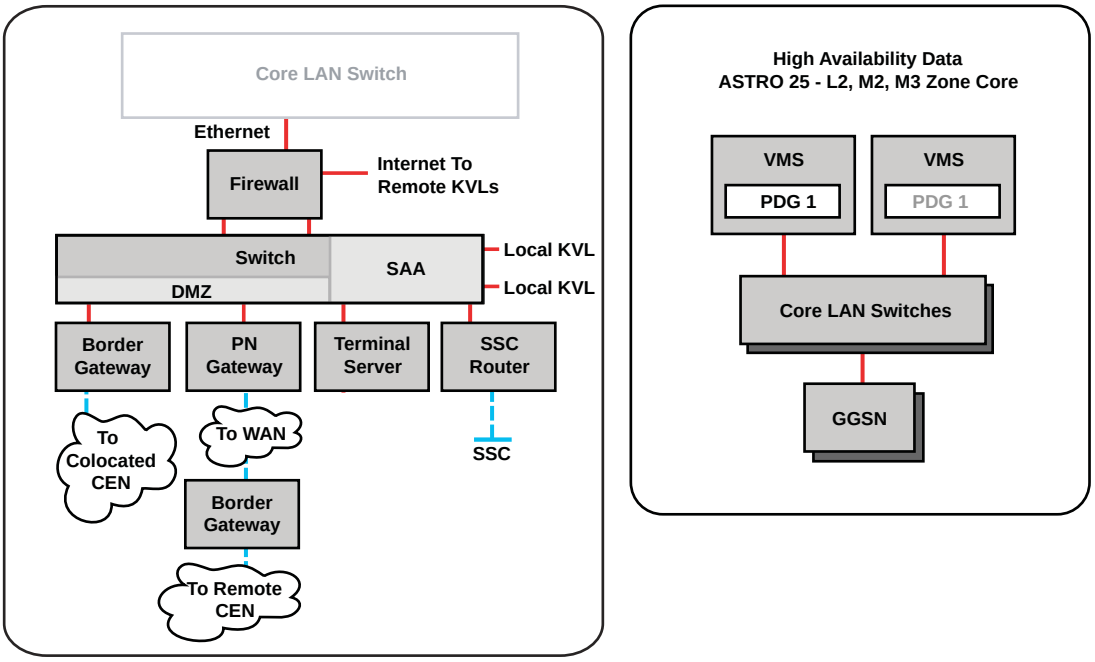


Figure 16: Zone Core Options



S_L1_L2_Zone_Core_Options_D

Figure 17: Hybrid Site Links - NonDSR (M2/M3)

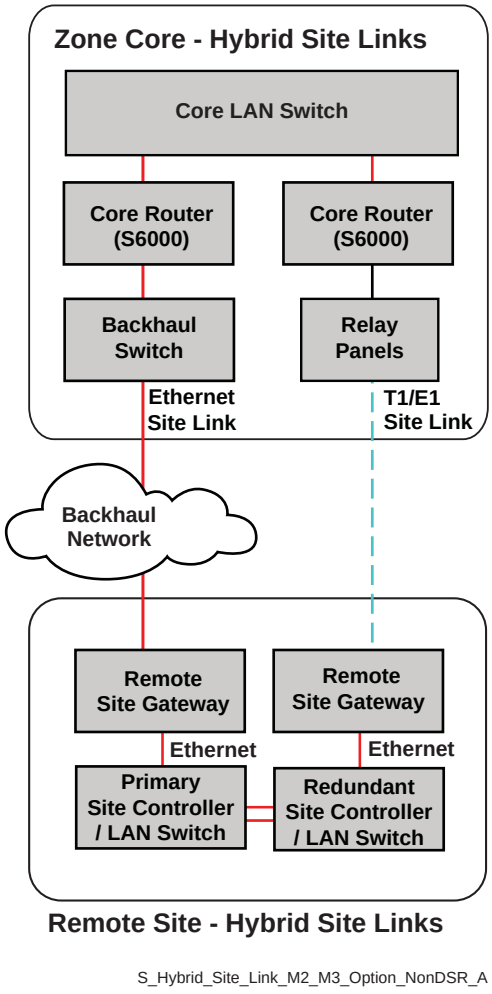


Figure 18: Hybrid Site Links - DSR (M2/M3) - Primary and Backup (Ethernet and T1/E1)

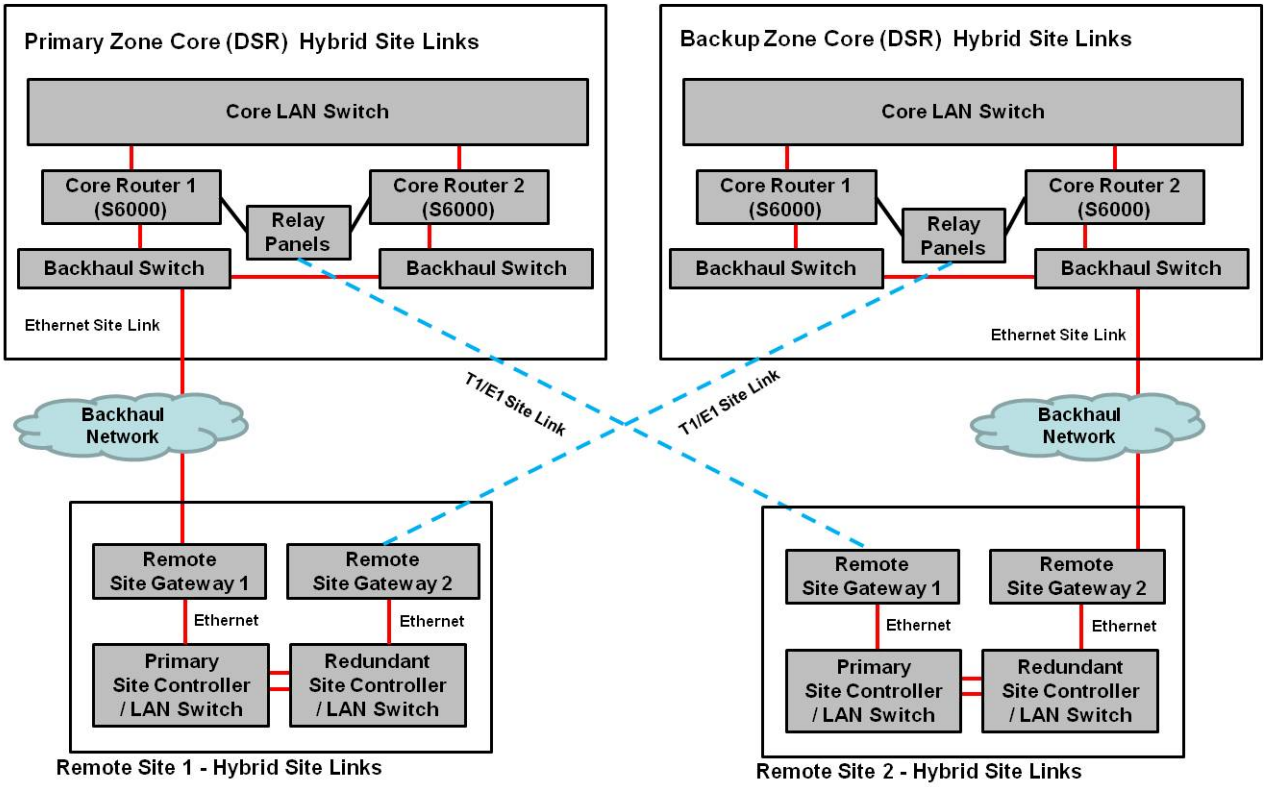


Figure 19: Hybrid Site Links - DSR (M2/M3) Primary Ethernet, Backup T1/E1

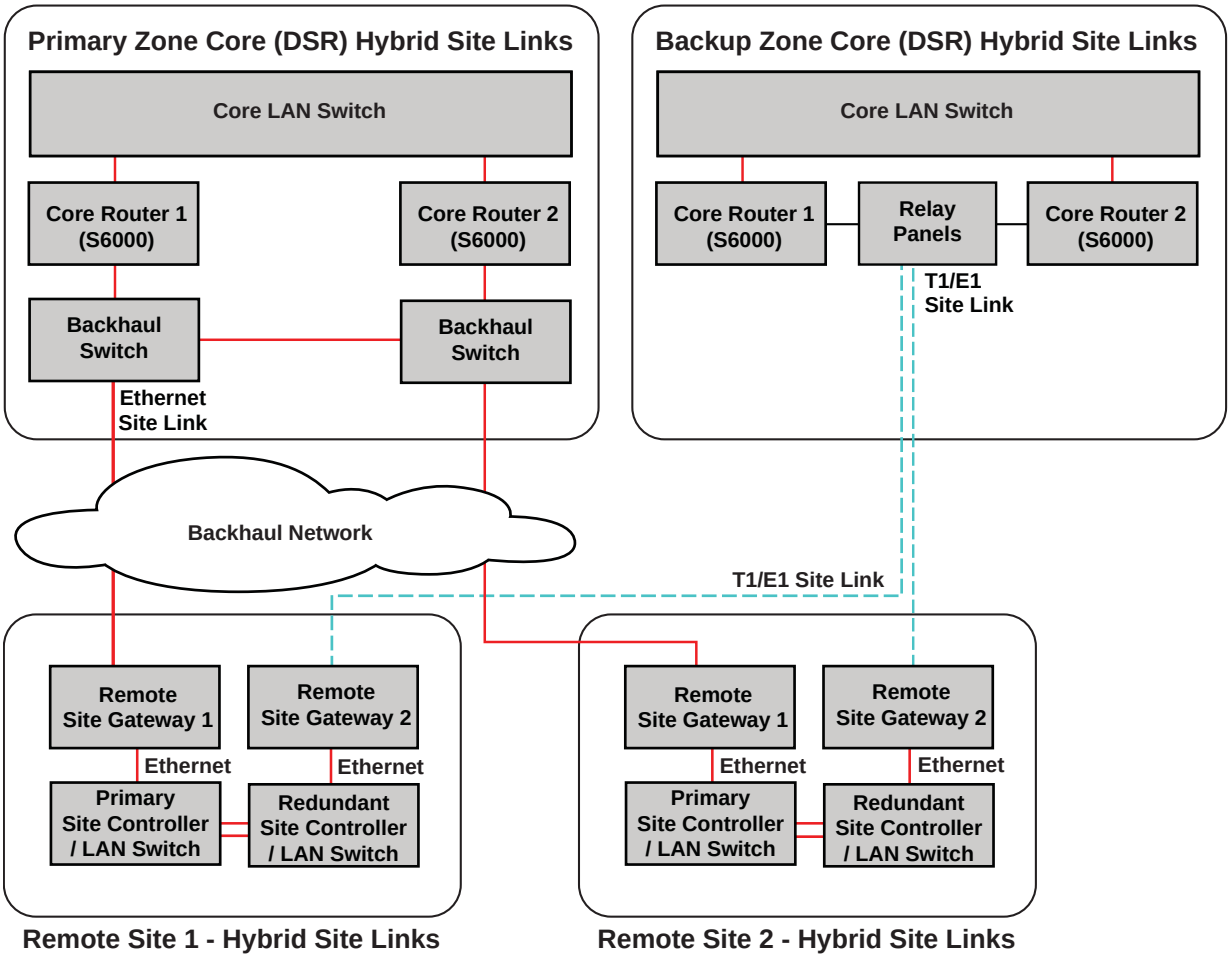


Figure 20: Zone Core (M1/M2/M3) Options — PTP

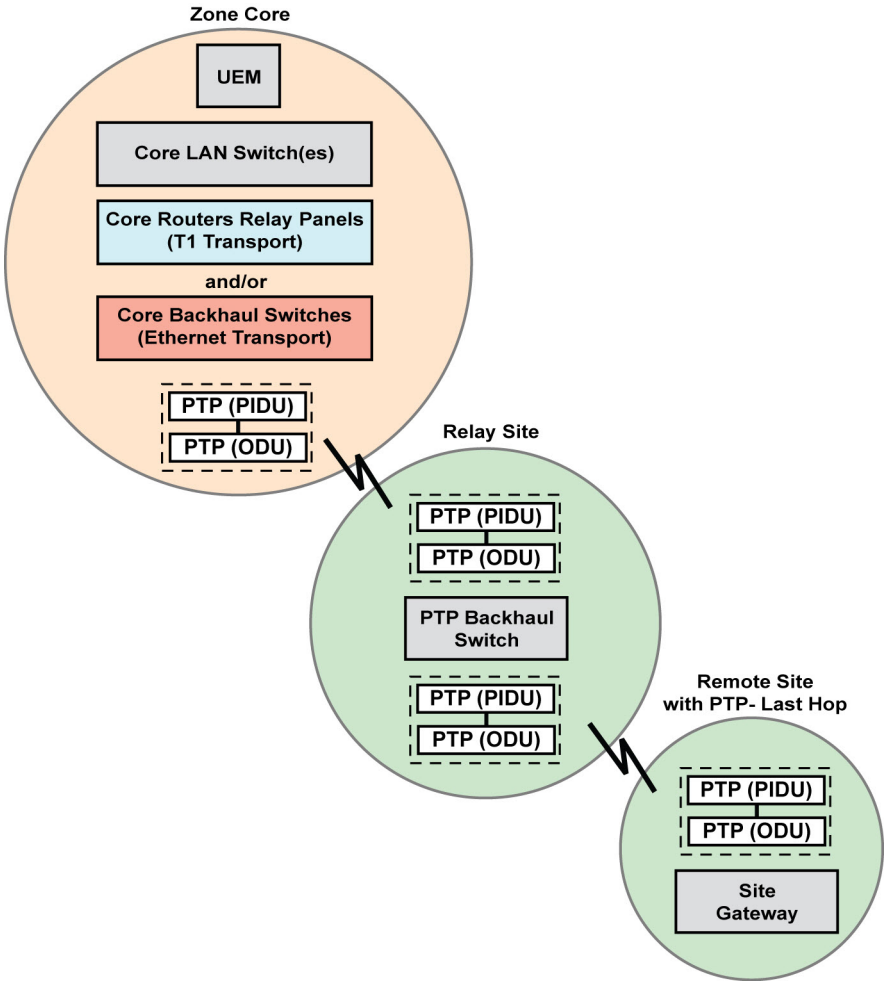
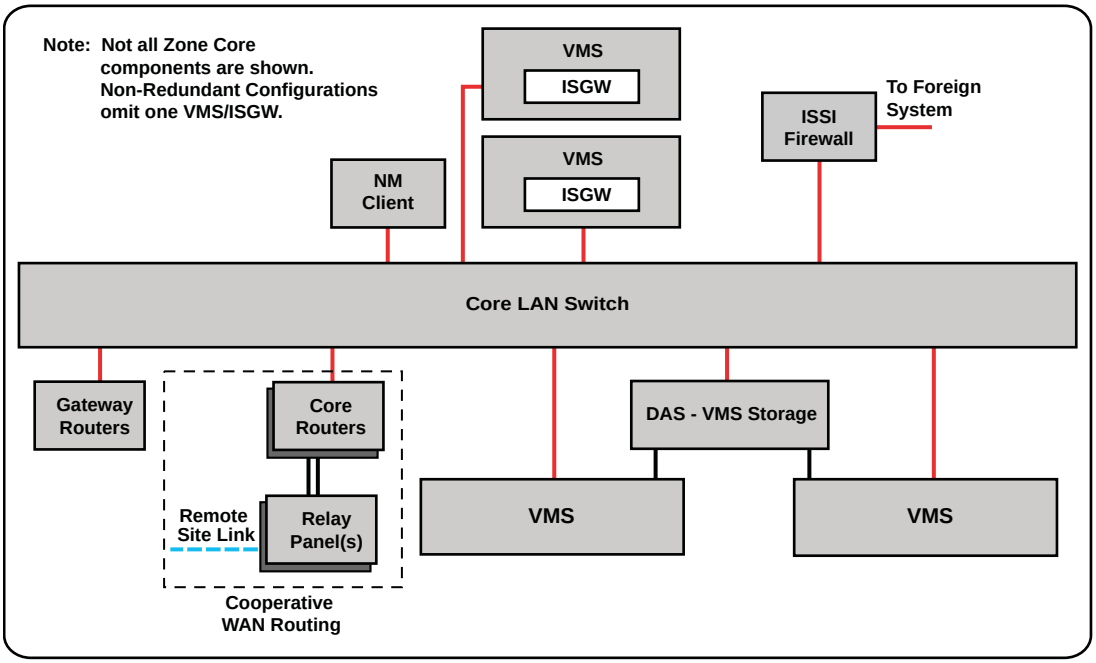
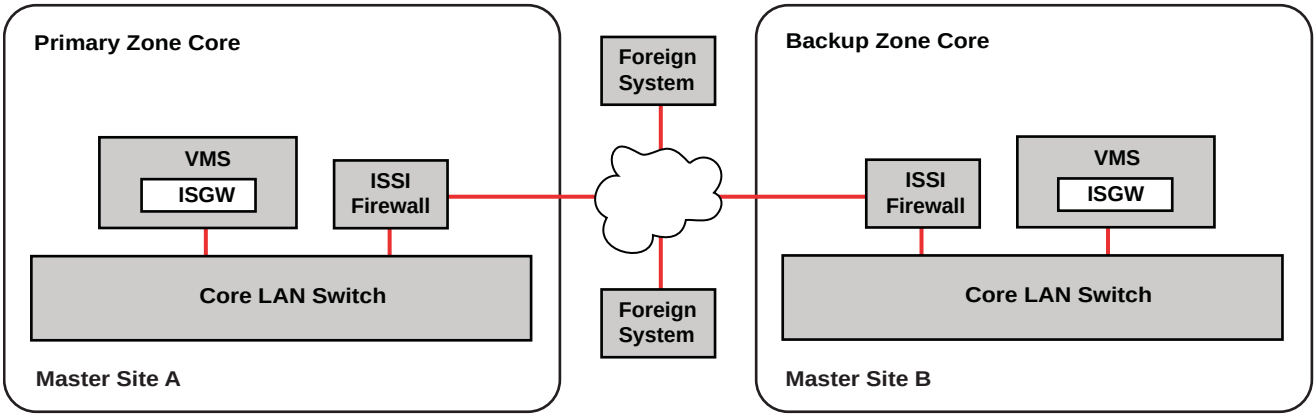


Figure 21: ISSI 8000/CSSI 8000 Zone Core Option



S_A714_ISSI8000_M2_M3_CSA_Zone_Core_Options_A

Figure 22: ISSI 8000 - DSR Zone Core Option



S_ISSI8000_DSR_Zone_core_option_B

Figure 23: CSSI 8000 - DSR Zone Core Option

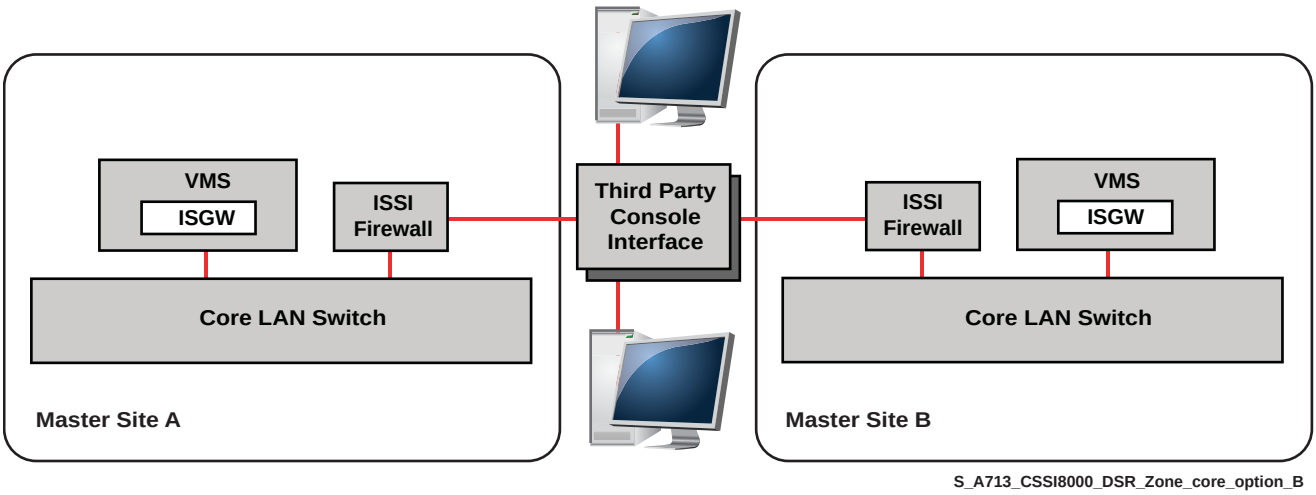


Figure 24: CSSI 8000 - Non-DSR Zone Core Option

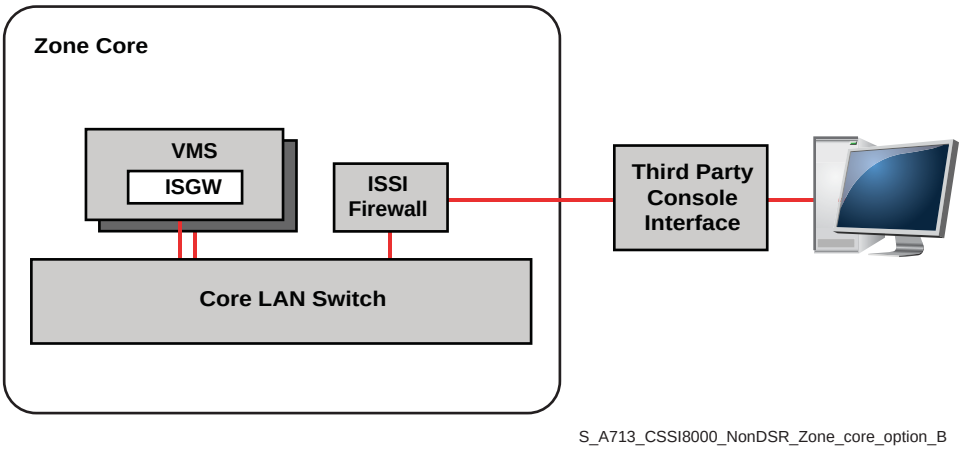


Figure 25: High Performance Data Standalone System

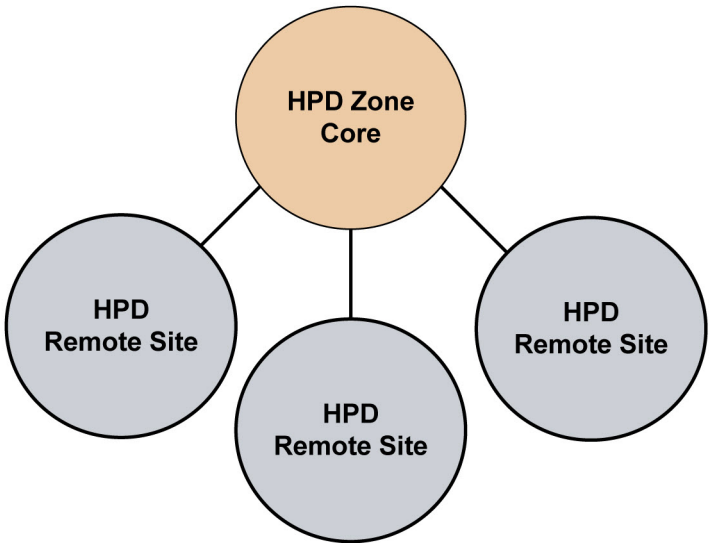


Figure 26: HPD Single Zone Non-Redundant Zone Core (M1)

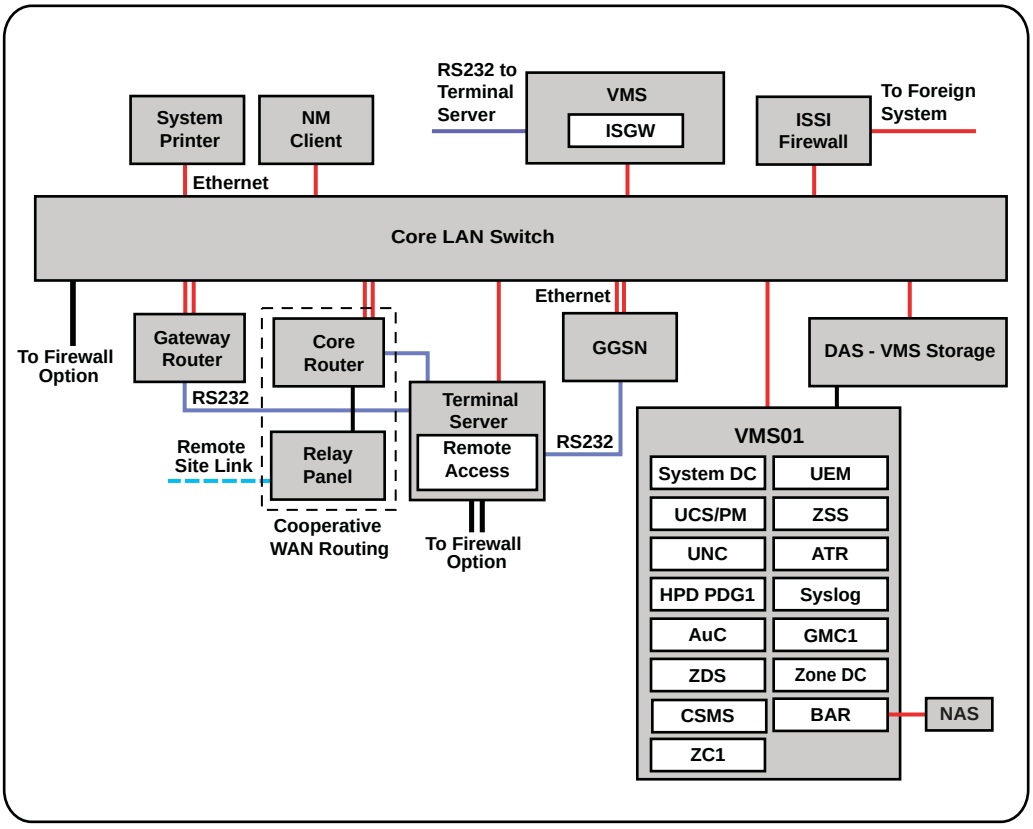
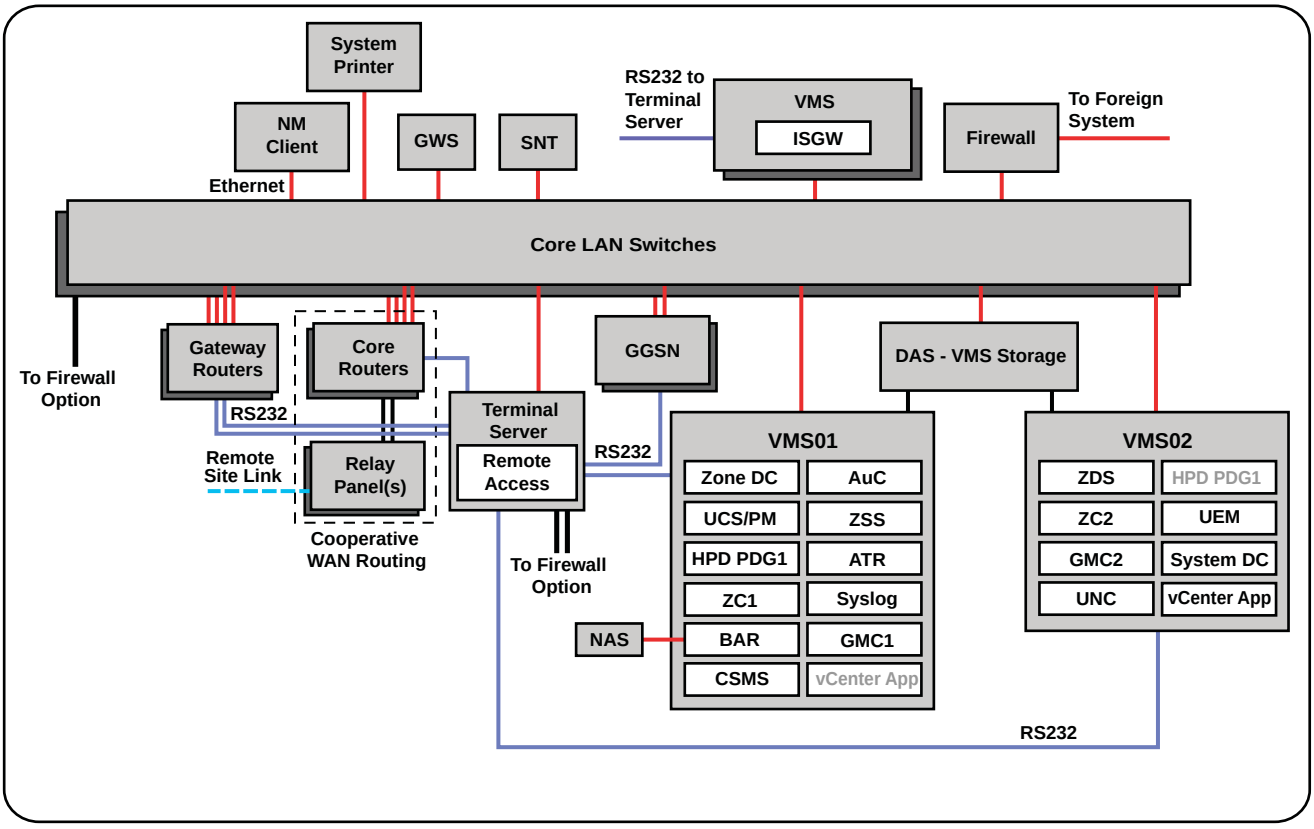
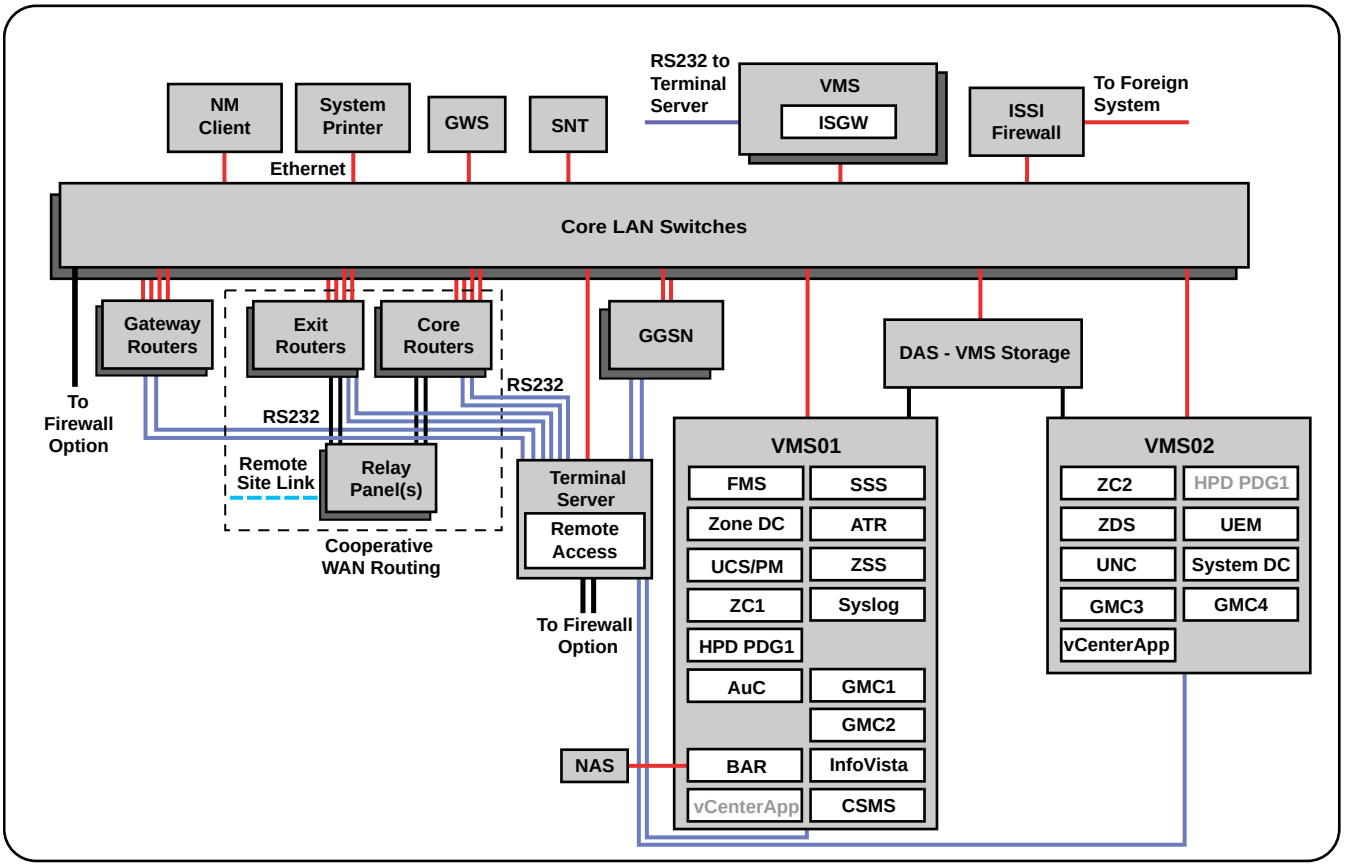


Figure 27: HPD Single Zone Redundant Zone Core (M2)



S_HPD_Standalone_M2_CSA_config_D

Figure 28: HPD Multi-Zone Capable Zone Core (M3)



S_HPD_Standalone_M3_CSA_config_D

Figure 29: ASTRO 25 Trunked System with IP Simulcast Subsystem

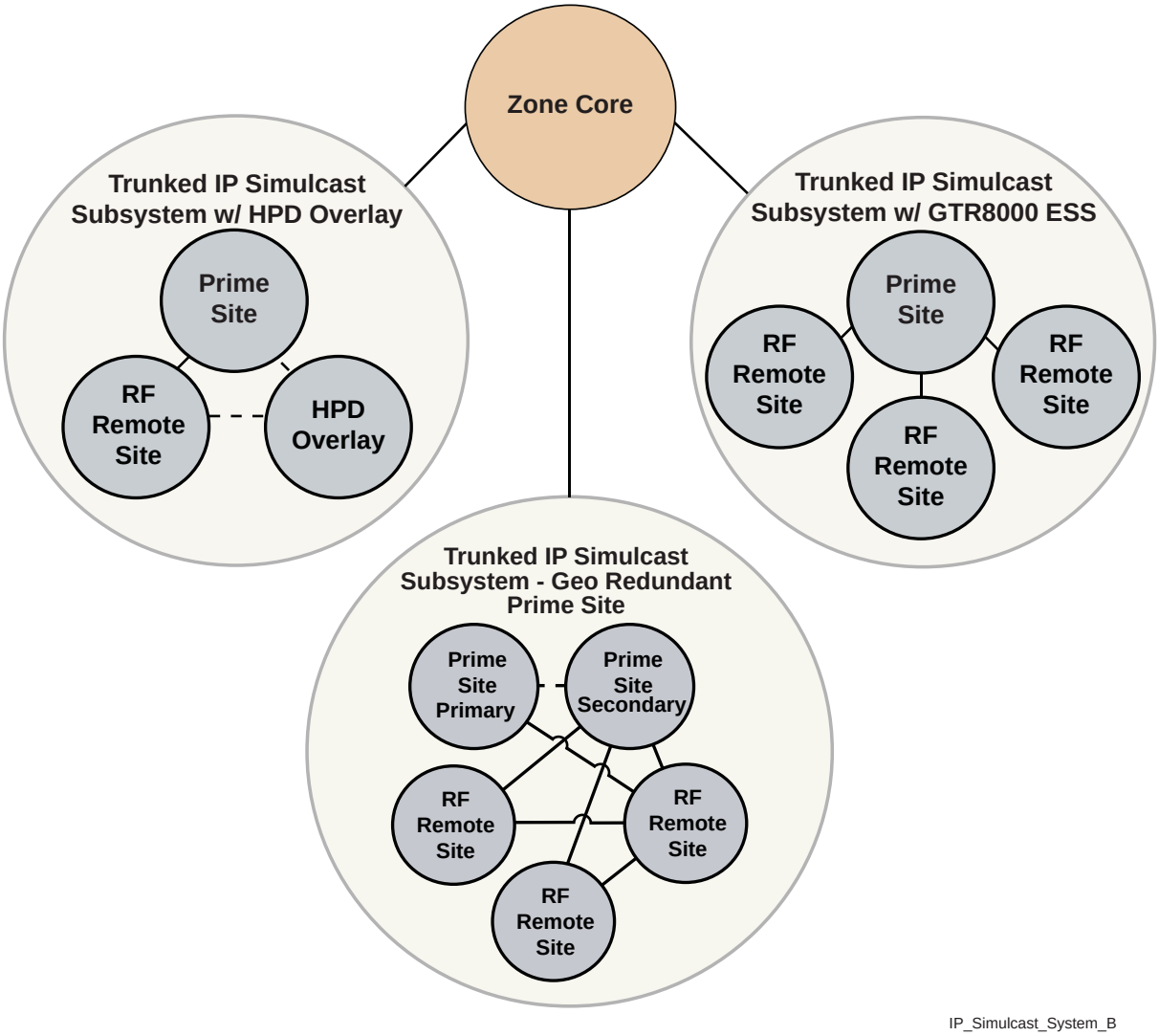
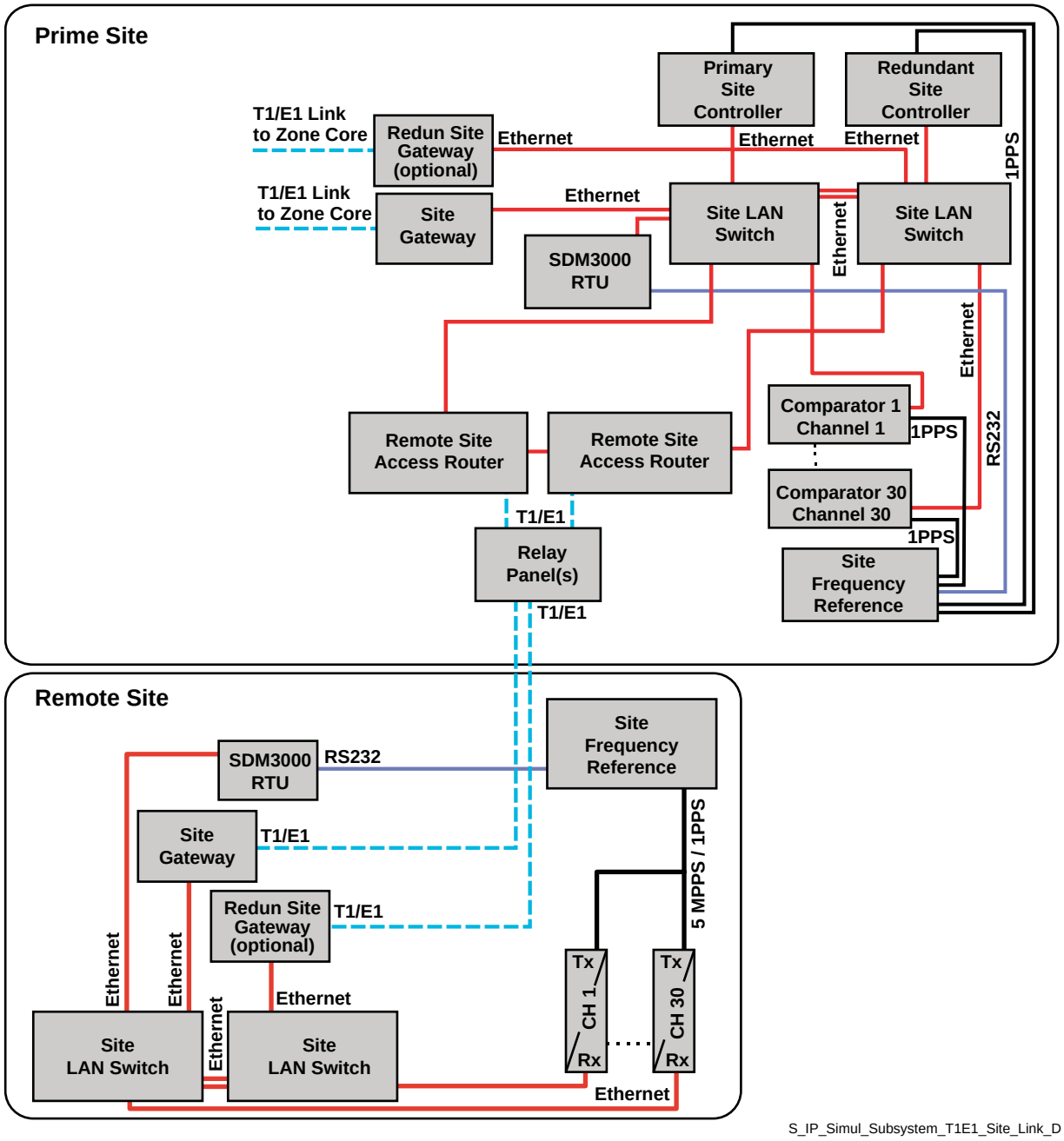
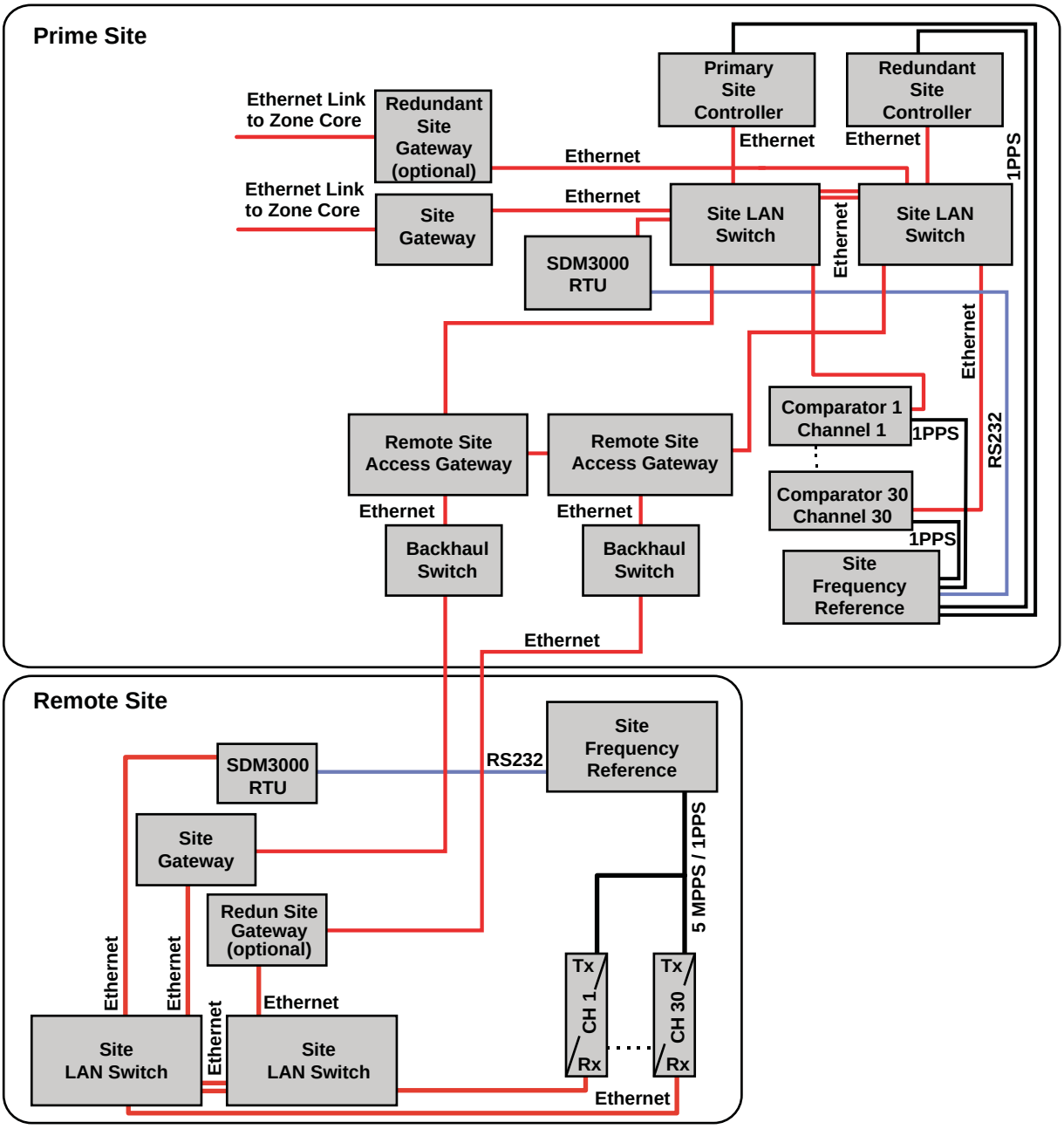


Figure 30: ASTRO 25 System Trunked IP Simulcast Subsystem (T1E1 Site Links)



S_IP_Simul_Subsystem_T1E1_Site_Link_D

Figure 31: ASTRO 25 System Trunked IP Simulcast Subsystem (Ethernet Site Links)



S_IP_Simul_Subsystem_Ethernet_Site_Link_E

Figure 32: ASTRO 25 System Trunked IP Simulcast Prime Site with HPD Overlay

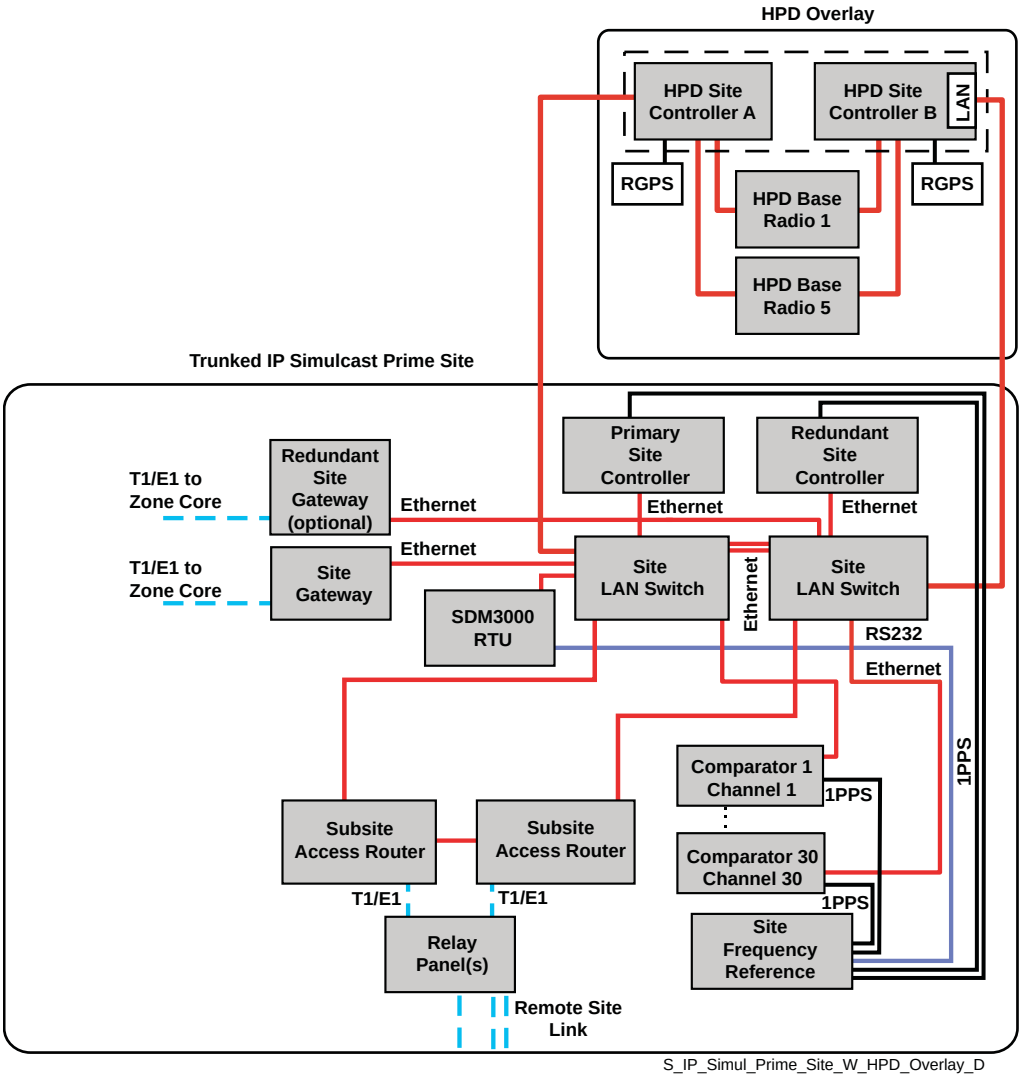


Figure 33: ASTRO 25 System Trunked IP Simulcast Subsystem with HPD Overlay at Remote Site

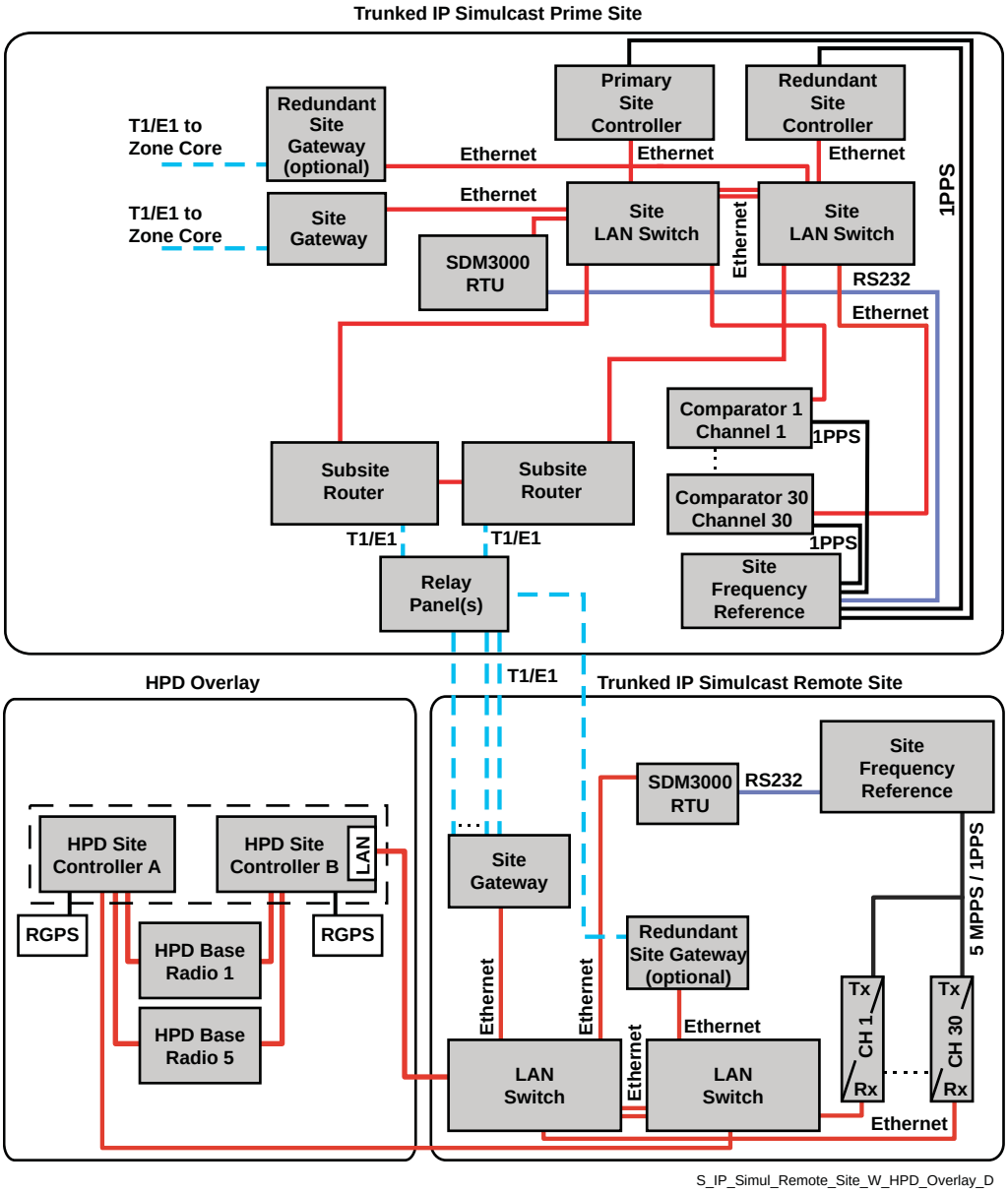
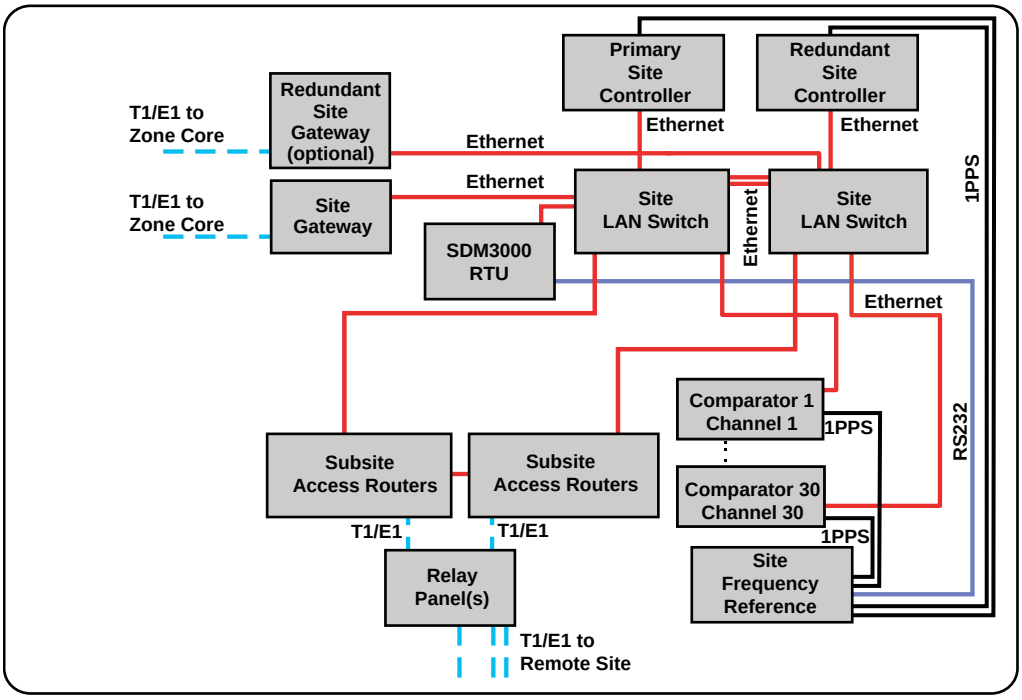
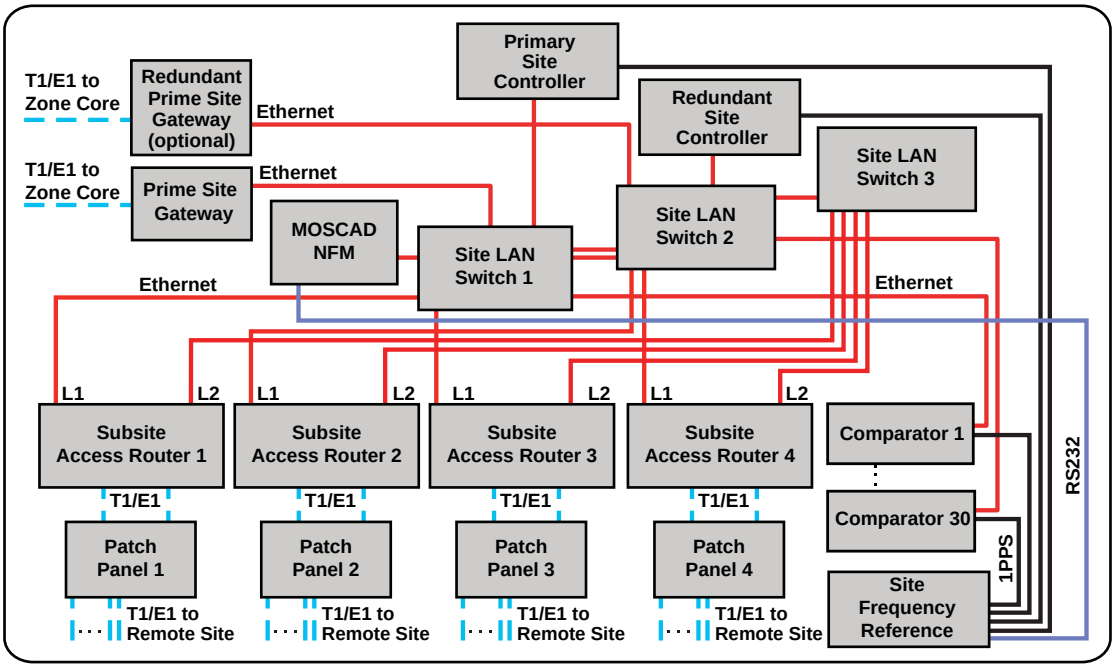


Figure 34: Trunked IP Simulcast Prime Site - Non Redundant Comparators, T1E1 Links (15 Subsites)



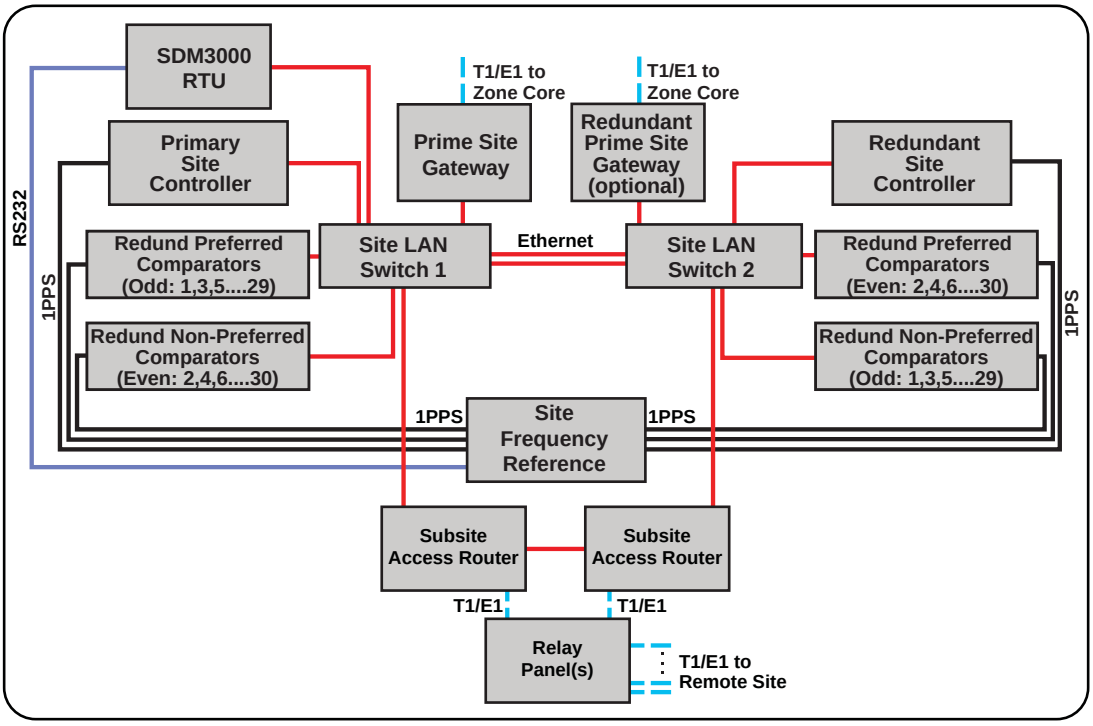
S_IP_Simul_Prime_Site_Non_Redun_Comp_T1E1_15_Subsite_A

Figure 35: Trunked IP Simulcast Prime Site - Non Redundant Comparators, T1E1 Links (32 Subsites)



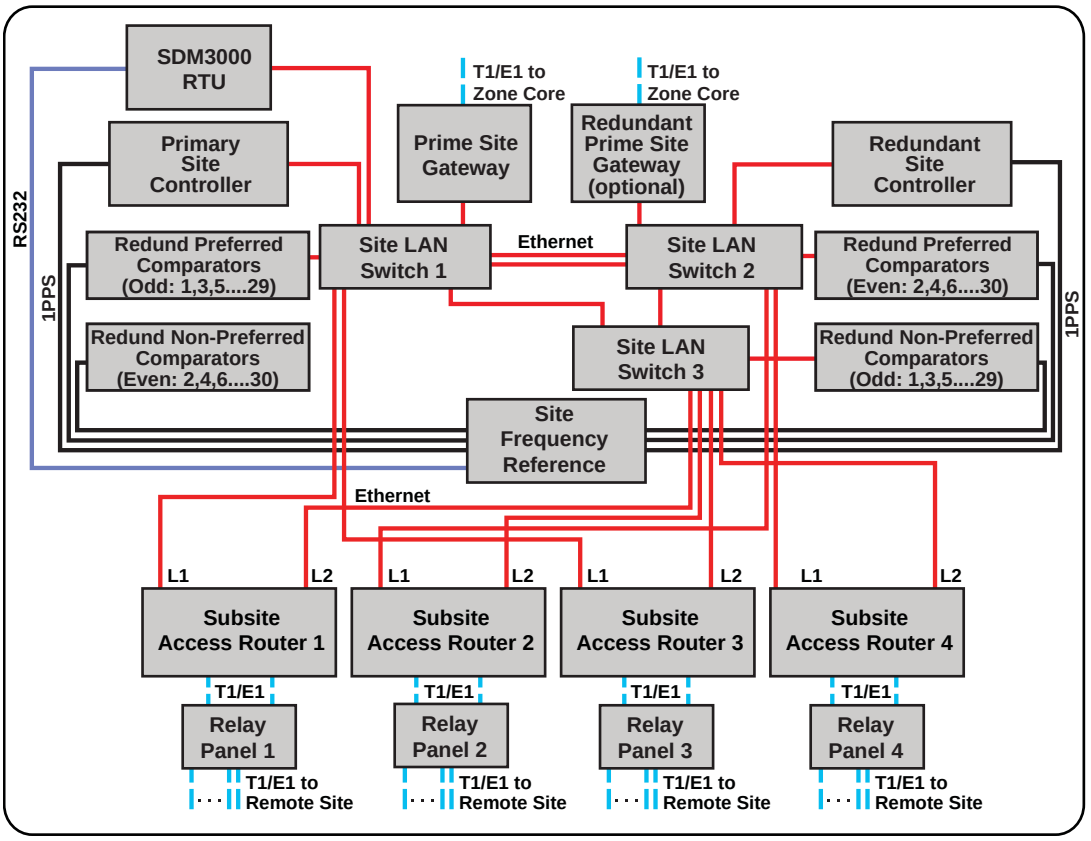
S_IP_Simul_Prime_Site_Non_Redun_Comp_T1E1_32_Subsite_A

Figure 36: Trunked IP Simulcast Prime Site - Redundant Comparators, T1E1 Links (15 Subsites)



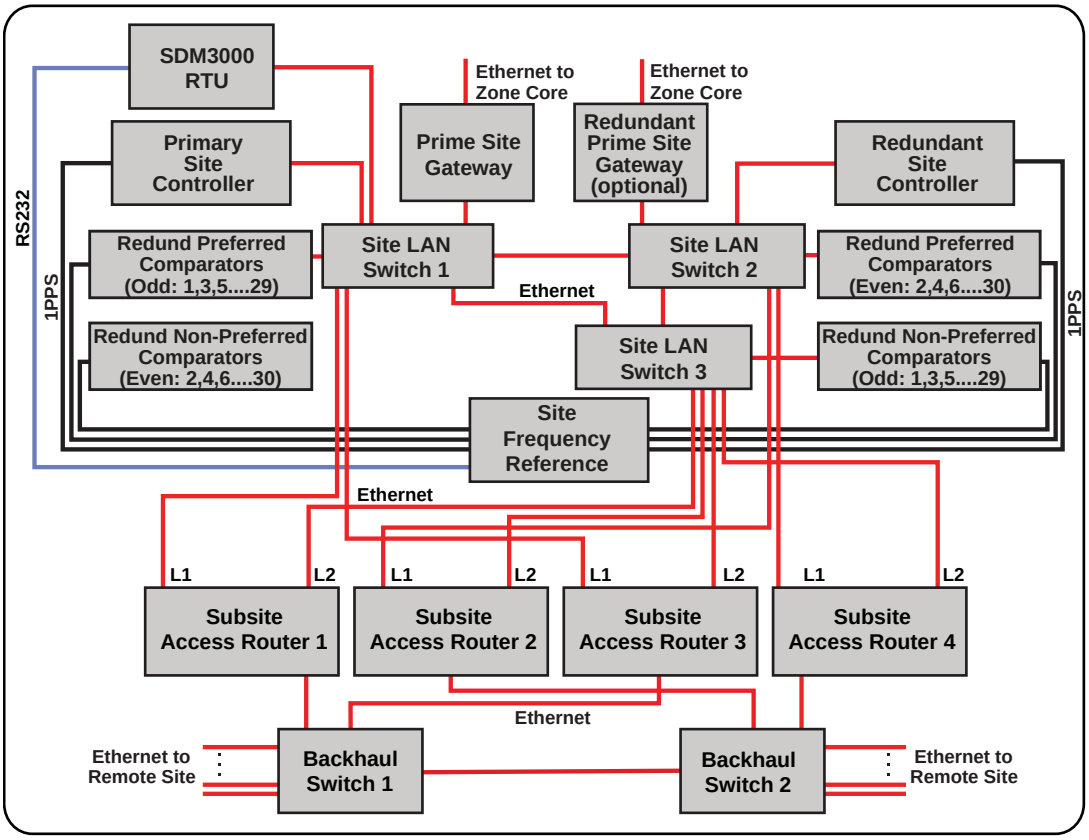
S_IP_Simul_Prime_Site_Redun_Comp_T1E1_15_Subsite_A

Figure 37: Trunked IP Simulcast Prime Site - Redundant Comparators, T1E1 Links (32 Subsites)



S_IP_Simul_Prime_Site_Redun_Comp_T1E1_32_Subsite_A

Figure 38: Trunked IP Simulcast Prime Site - Redundant Comparators, Ethernet Links (32 Subsites)



S_IP_Simul_Prime_Site_Redun_Comp_Ethernet_32_Subsite_A

Figure 39: ASTRO 25 System Trunked IP Simulcast Prime Site with High Availability

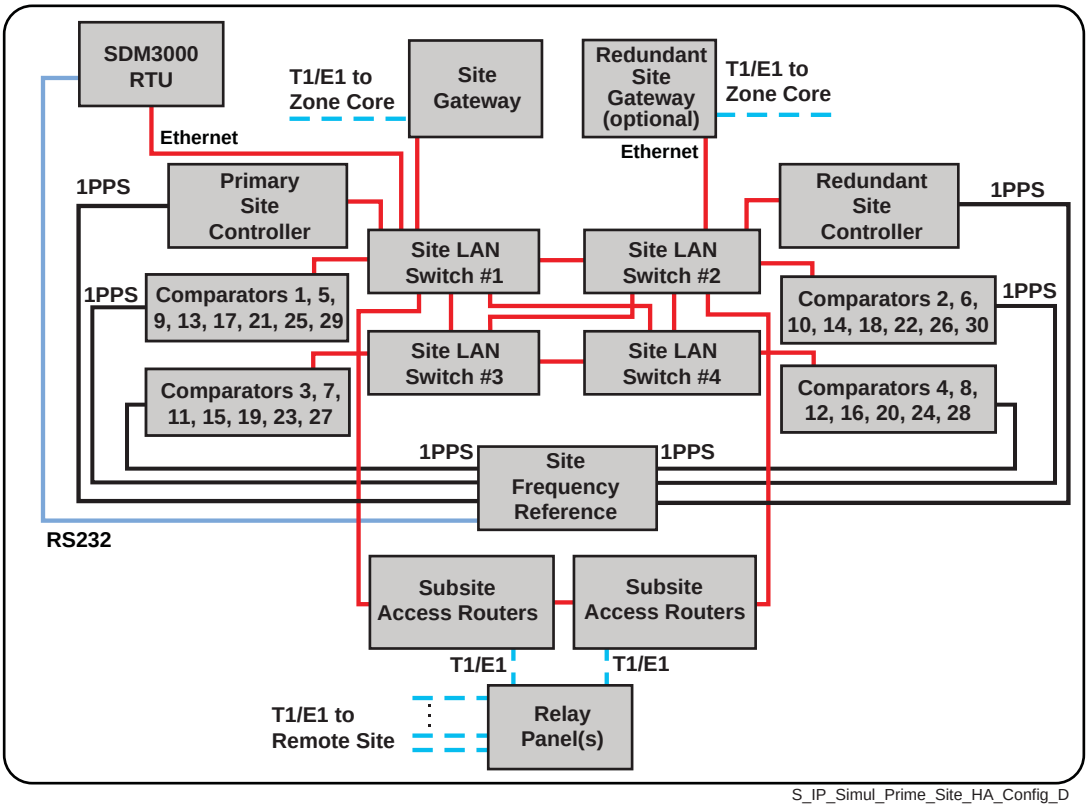
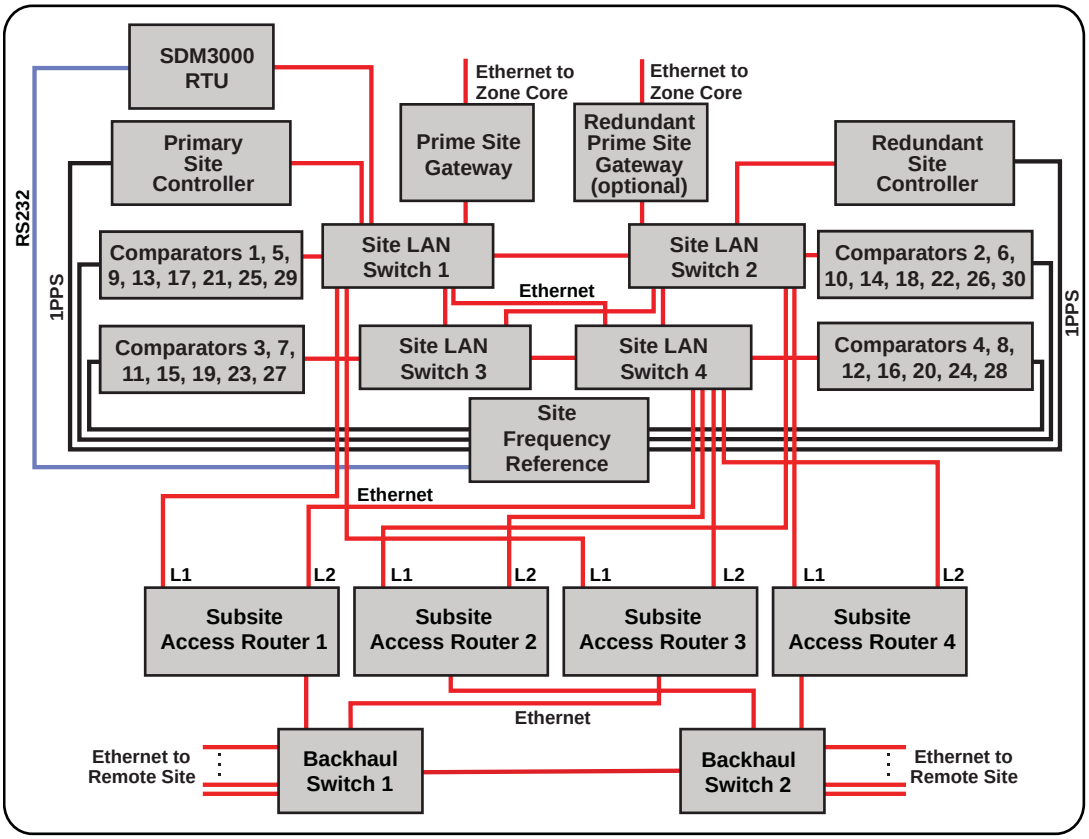
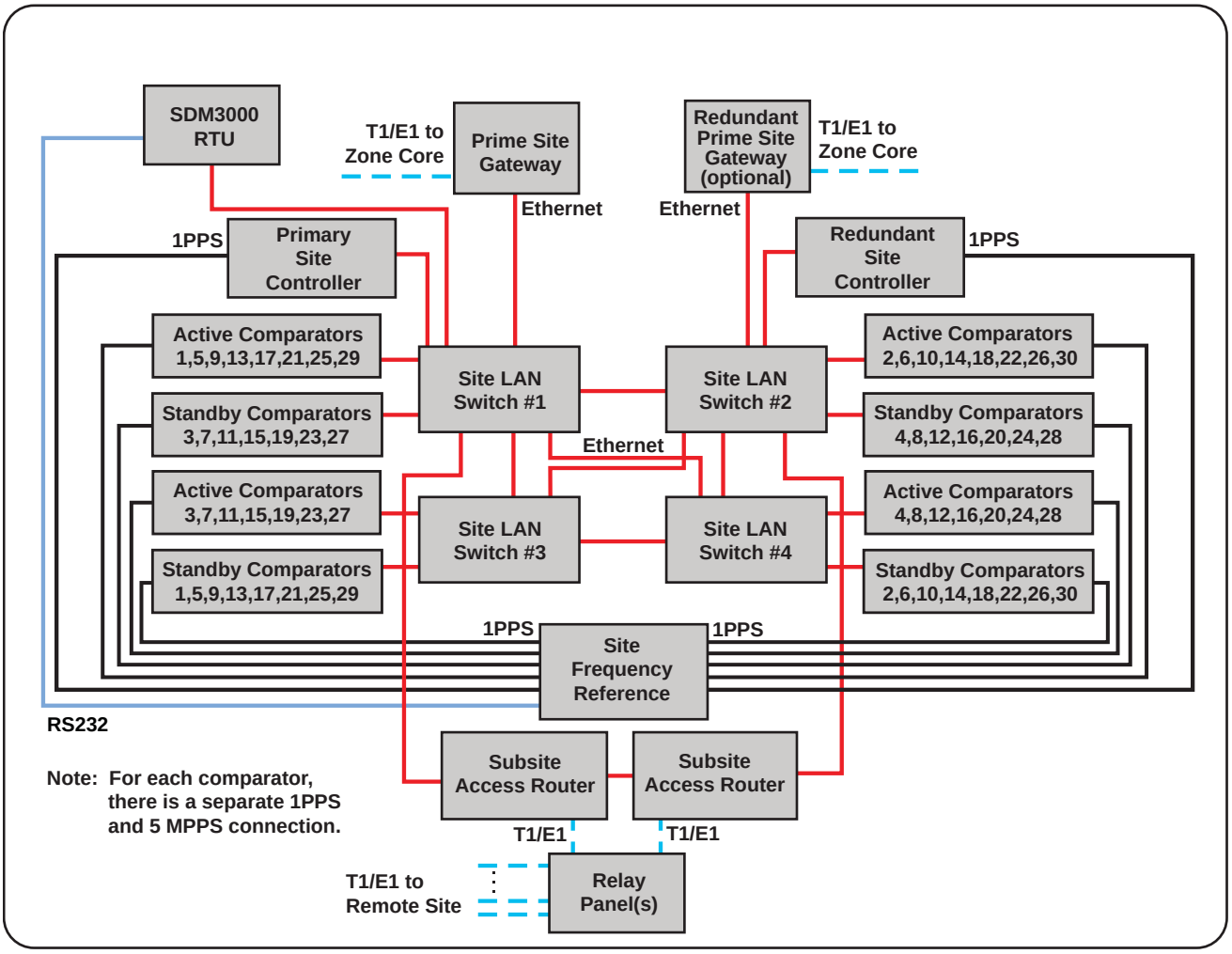


Figure 40: ASTRO 25 System Trunked IP Simulcast Prime Site - High Availability 32 Subsite Support



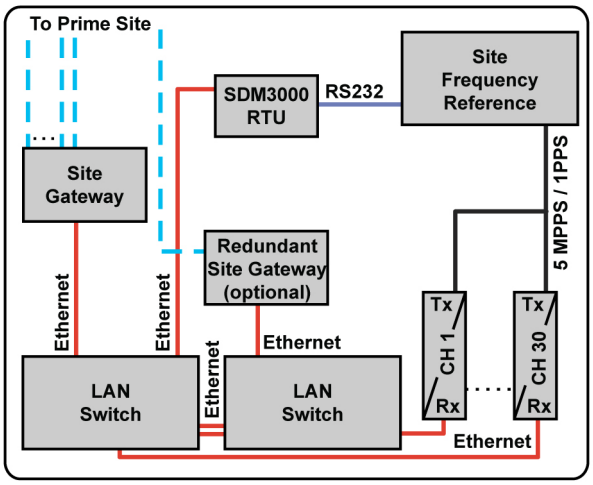
S_IP_Simul_Prime_HA_32_Subsite_B

Figure 41: ASTRO 25 System Trunked IP Simulcast Prime Site with High Availability and Redundant Comparators



S_IP_Simul_Prime_Site_HA_Redun_Comp_C

Figure 42: ASTRO 25 System Trunked IP Simulcast Remote Site



S_IP_Simul_Remote_Site_B

Figure 43: ASTRO 25 System Trunked IP Simulcast Remote Site - Expandable Site Subsystem - Standard Configuration

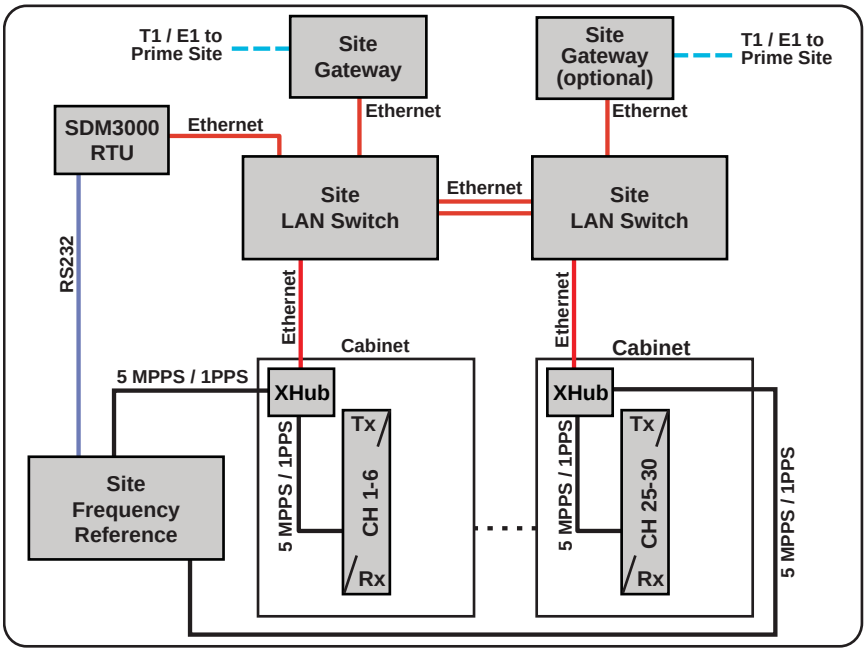


Figure 44: ASTRO 25 System Trunked IP Simulcast Remote Site - Expandable Site Subsystem - High Availability

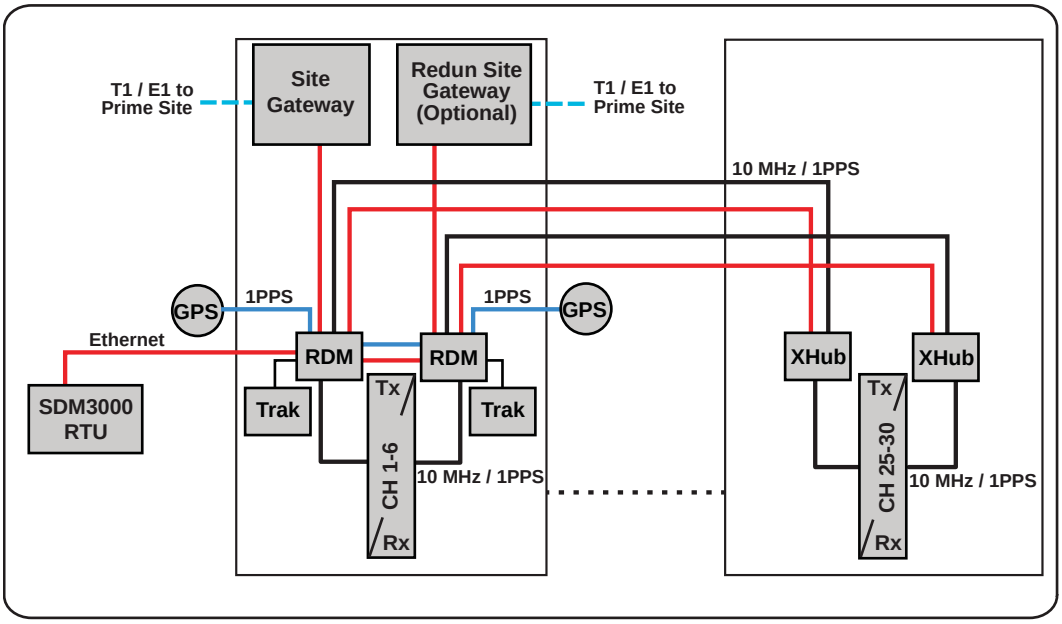


Figure 45: ASTRO 25 System Trunked IP Simulcast Prime Site - Geographical Redundancy

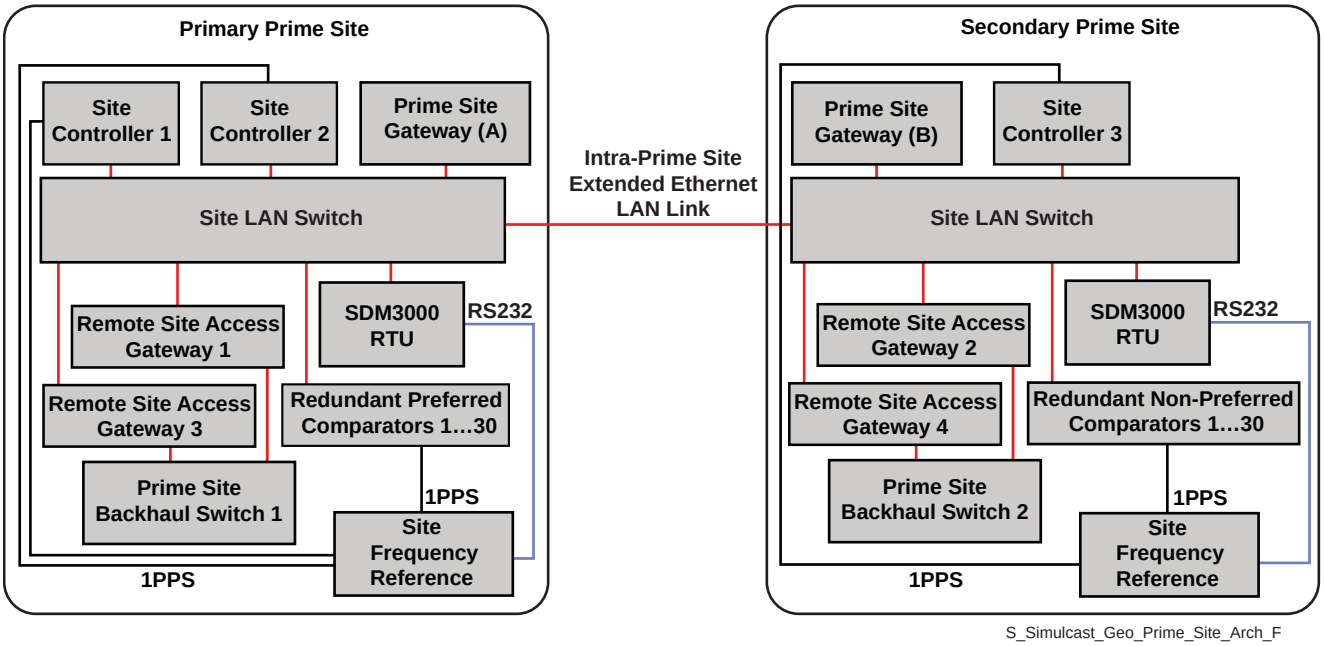


Figure 46: ASTRO 25 System with ASTRO 25 Trunked Repeater Sites

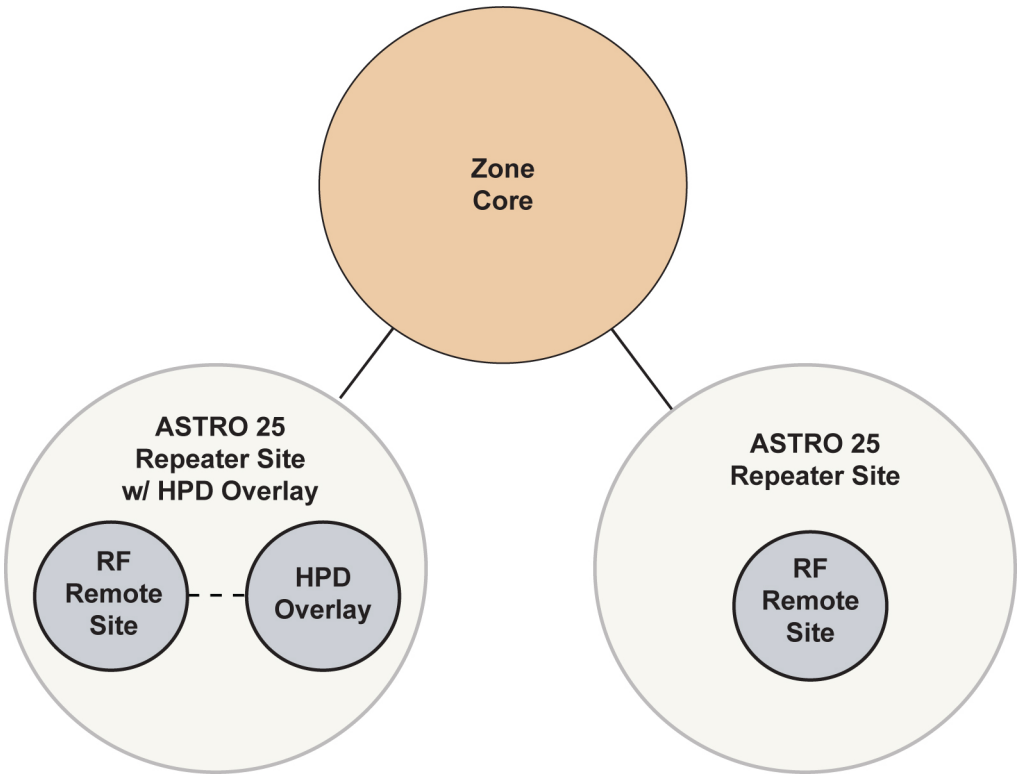


Figure 47: ASTRO 25 Trunked Repeater Site

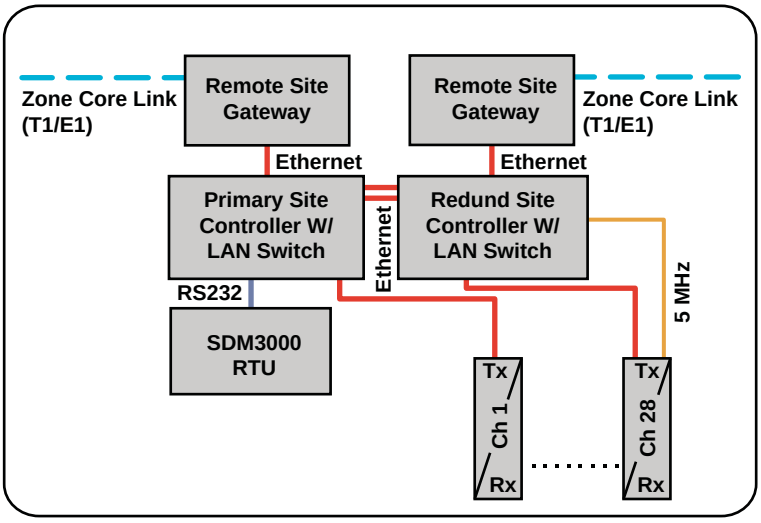


Figure 48: ASTRO 25 Trunked Repeater Site with HPD Overlay

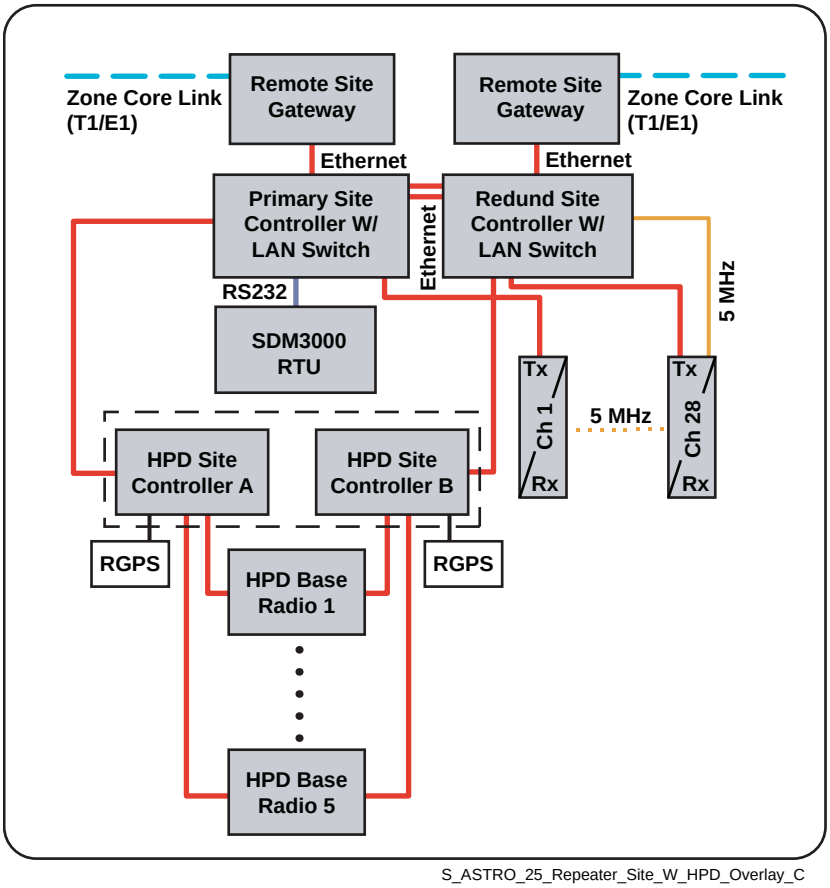


Figure 49: ASTRO 25 MCC 7500 Dispatch Console Subsystem

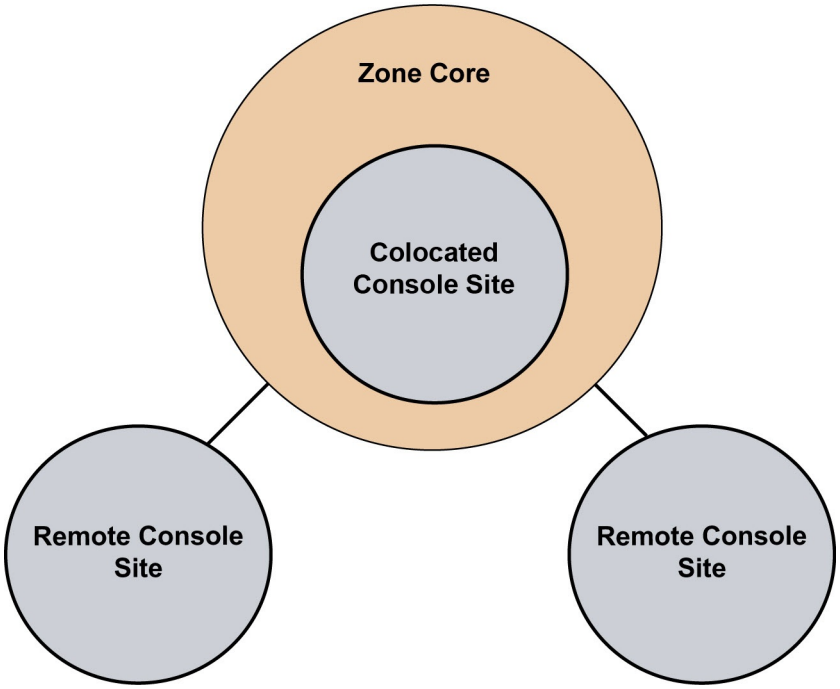
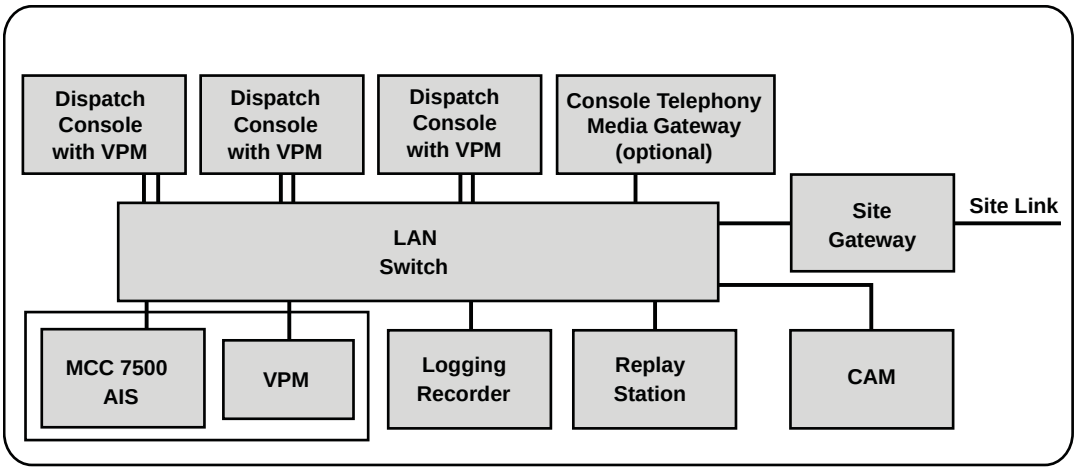
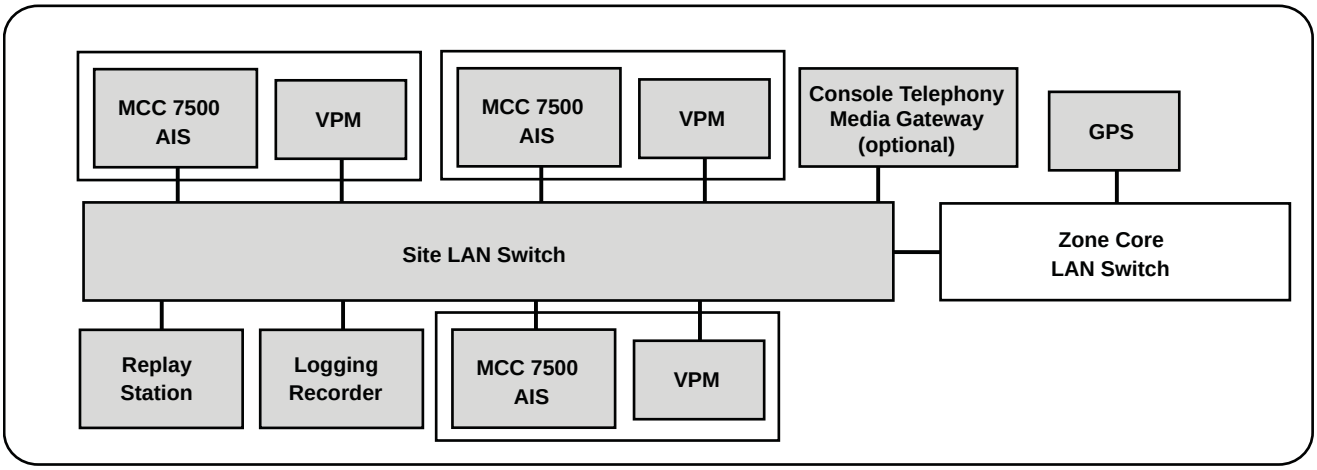


Figure 50: ASTRO 25 Remote Dispatch Console Subsystem with Logging Option



MCC7500_dispatch_console_subsystem_wlogging2_A

Figure 51: ASTRO 25 Colocated Dispatch Console Subsystem with Logging Option



MCC7500_dispatch_console_subsystem_colocated_w_zone_core_F

Figure 52: MCC 7500 Dispatch Console Interoperability with Gold Elite

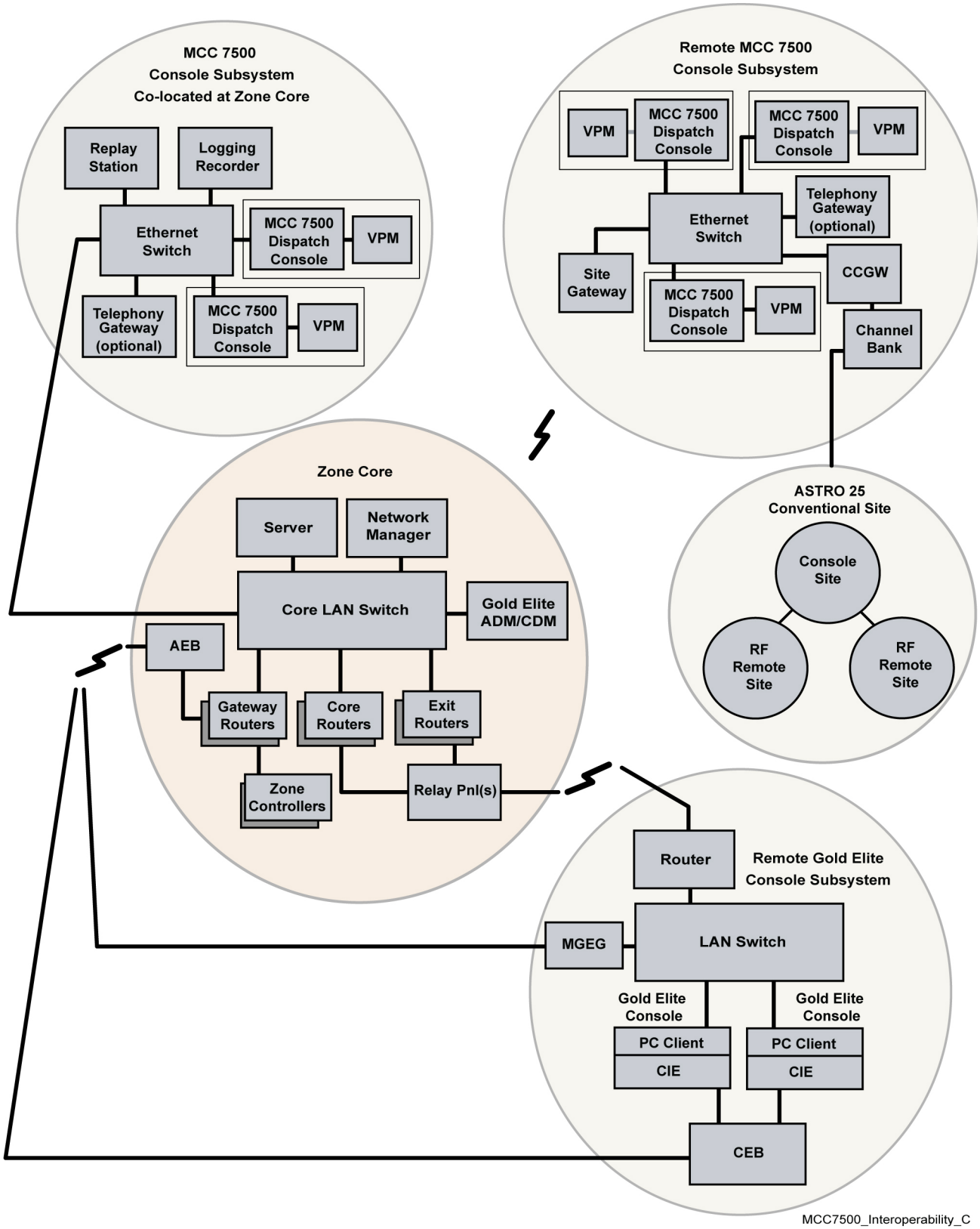


Figure 53: MCC 7100 System Architecture

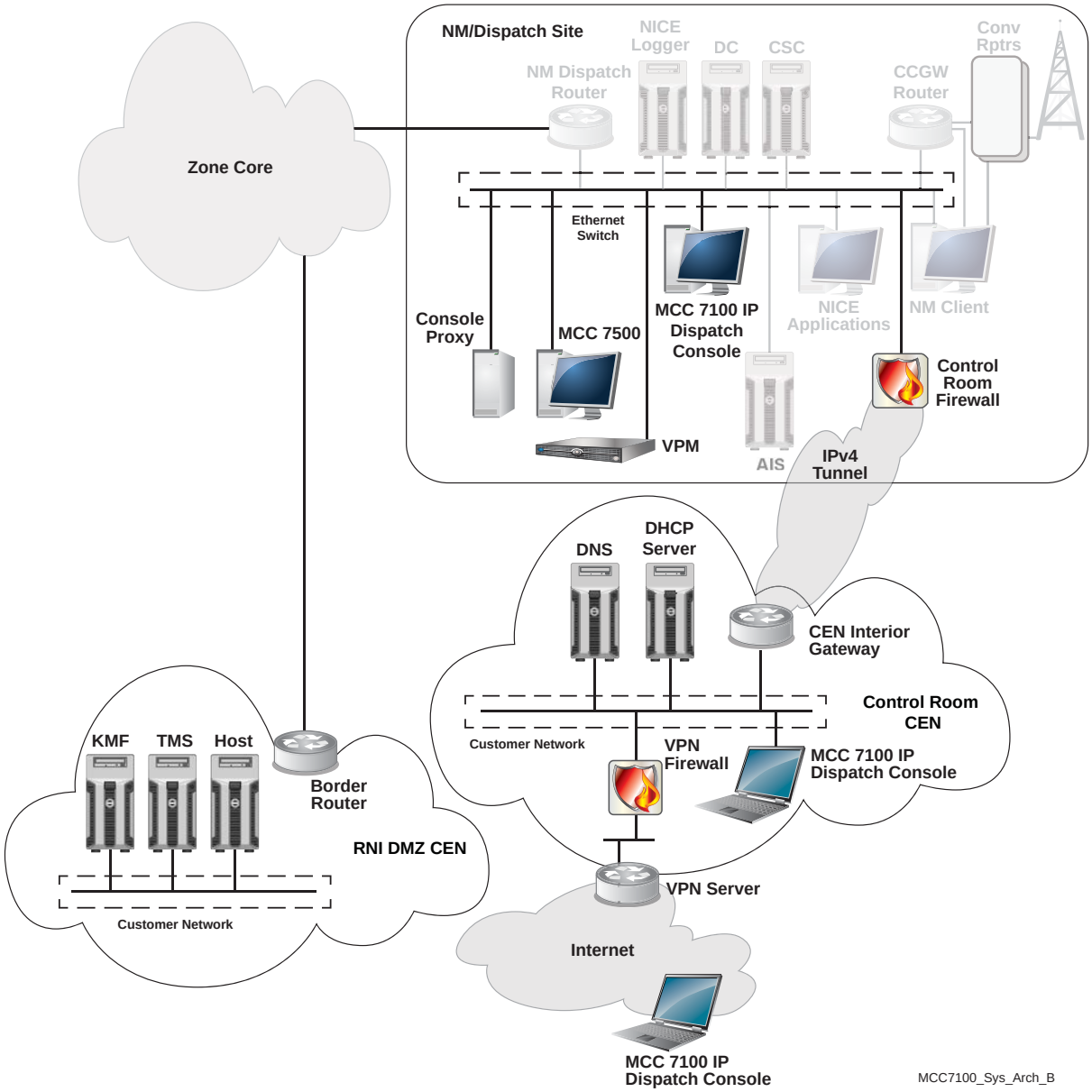
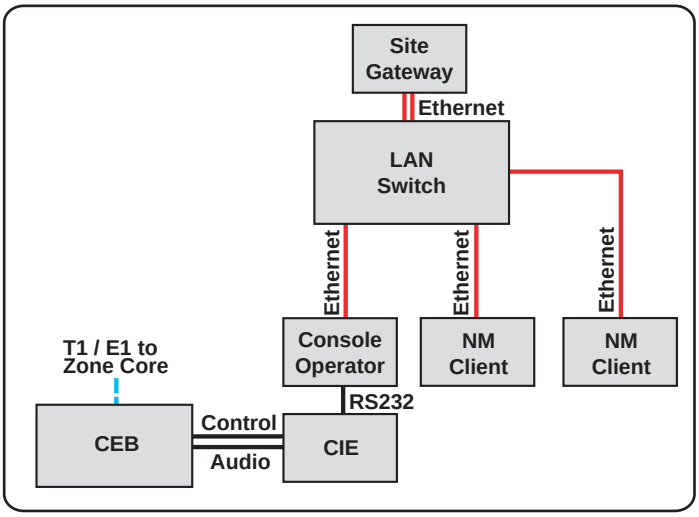


Figure 54: ASTRO 25 Remote Network Management (NM) Console Op Site



S_Remote_NM_console_op_site1

Figure 55: ASTRO 25 Distributed Conventional Subsystem

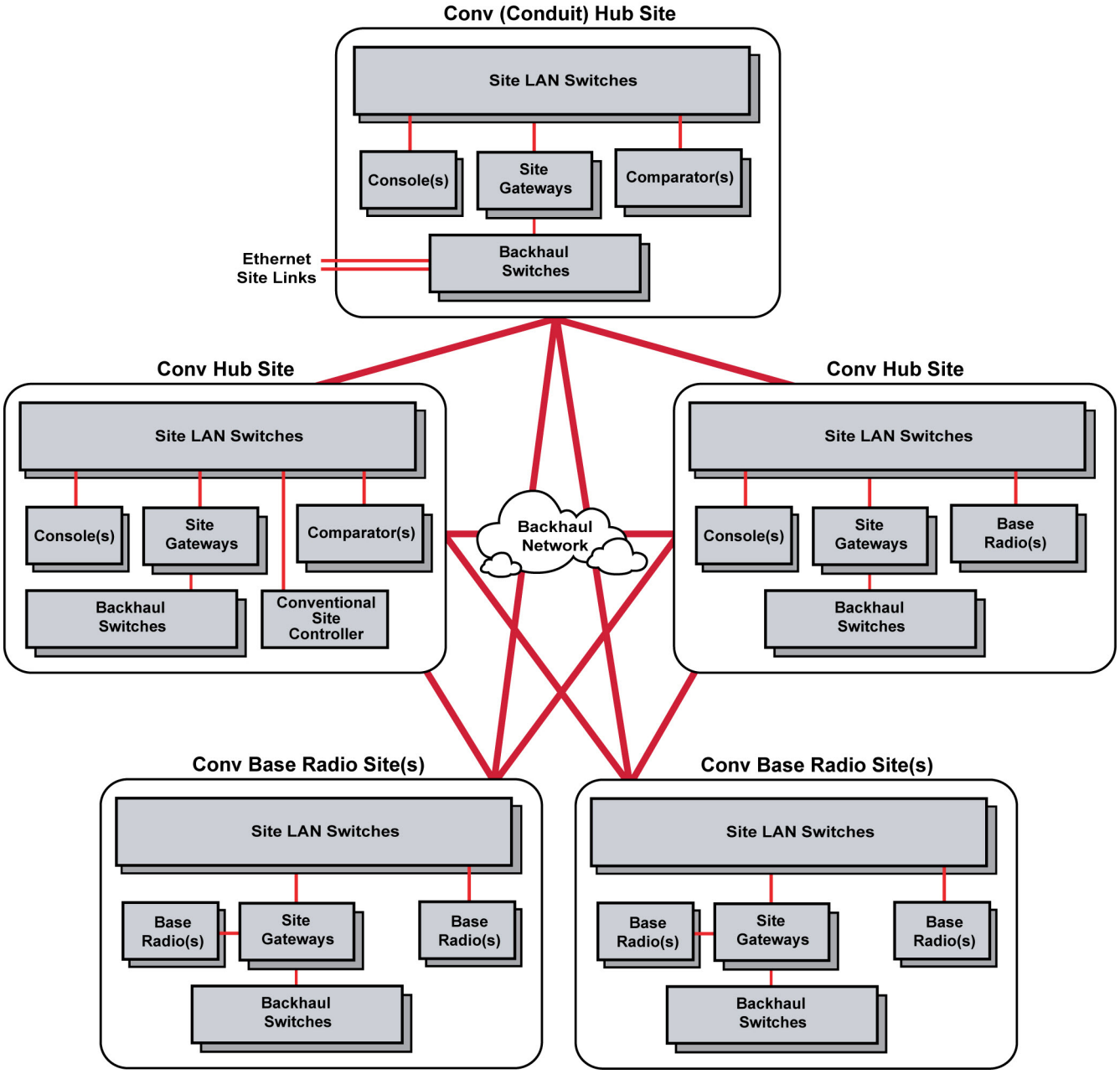
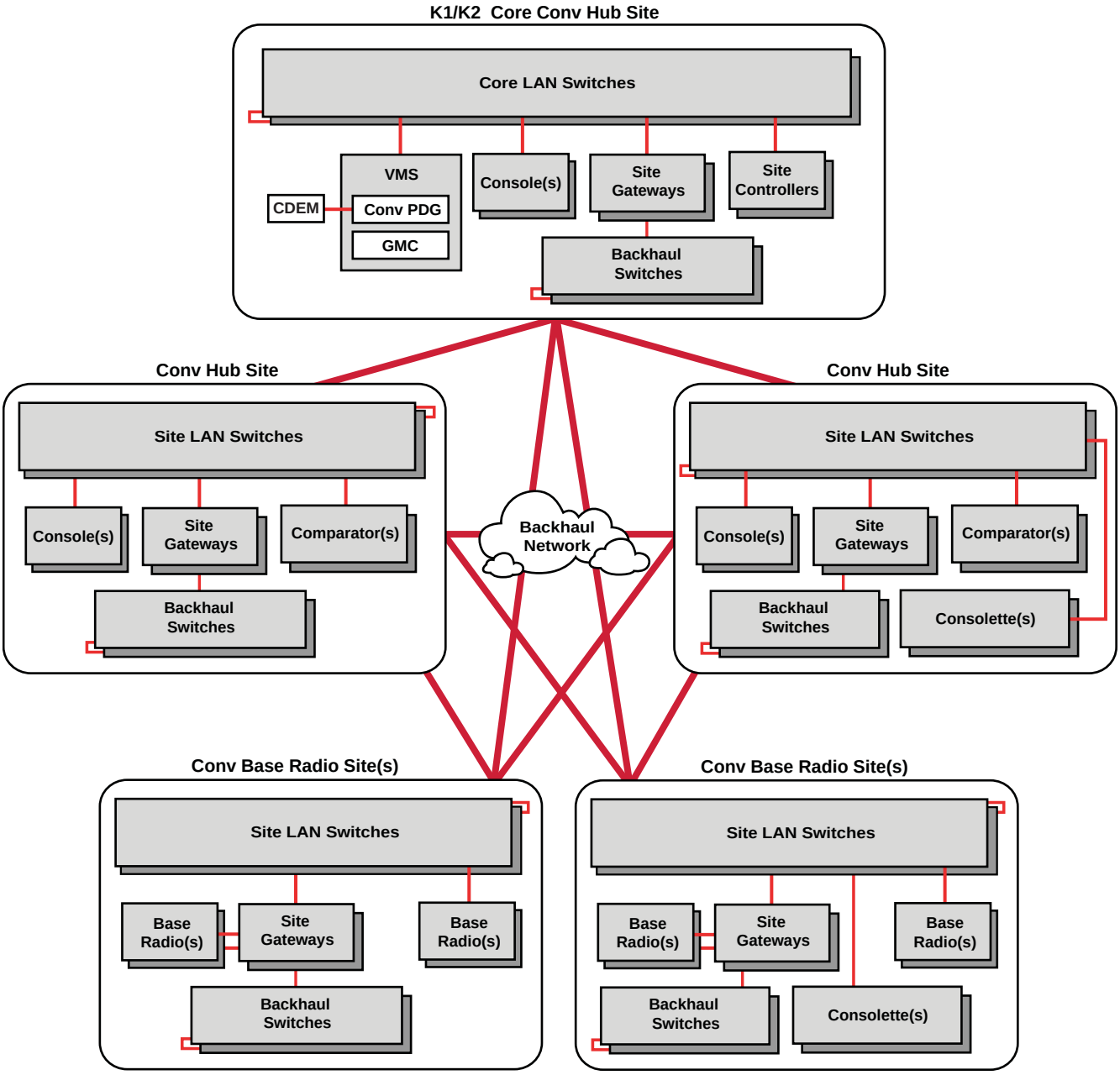


Figure 56: ASTRO 25 Distributed Conventional System with K Core



Note: This high-level system architecture diagram shows a conceptual view of the sites and their relationships. Not all components are shown and connections shown are hypothetical not physical.

K1_K2_system_arch_H

Figure 57: ASTRO 25 Conventional and Integrated Data System (K1)

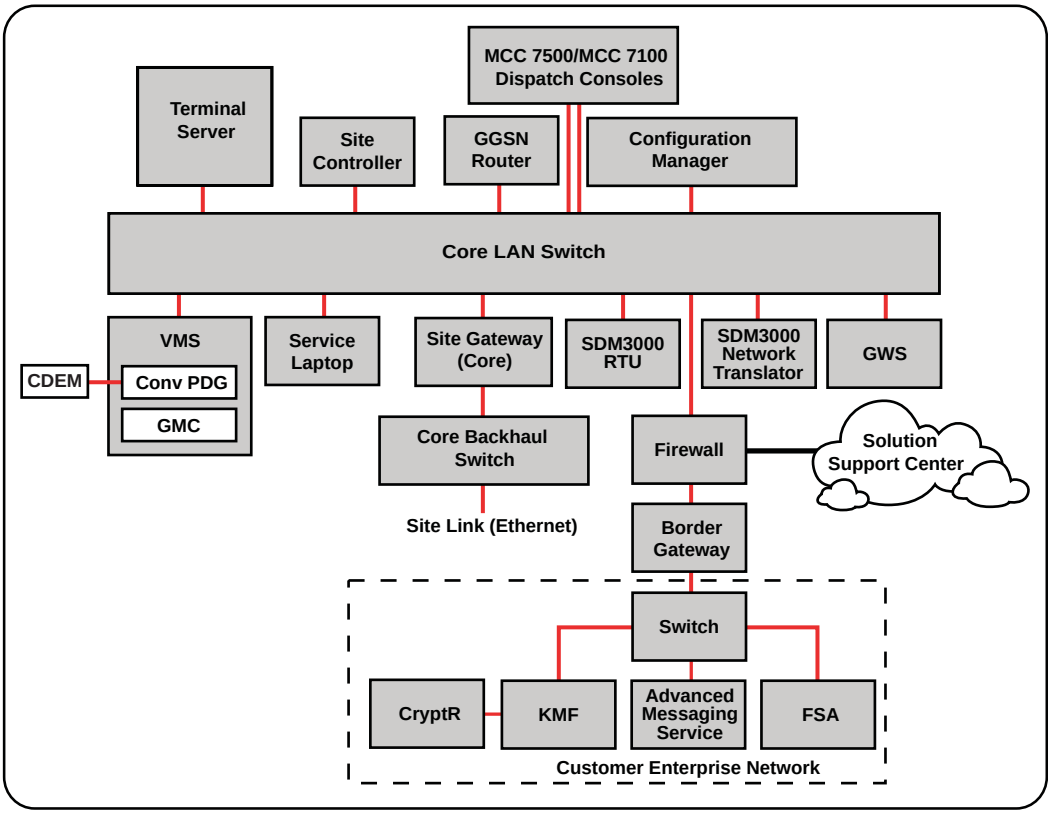
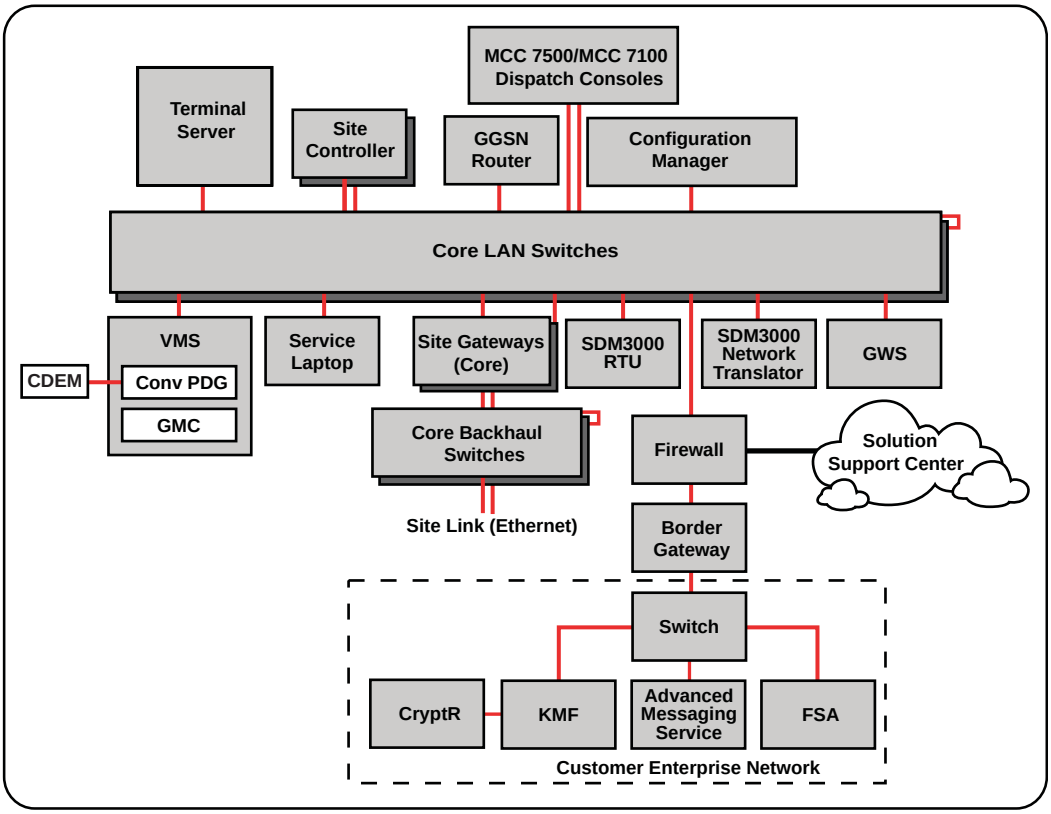
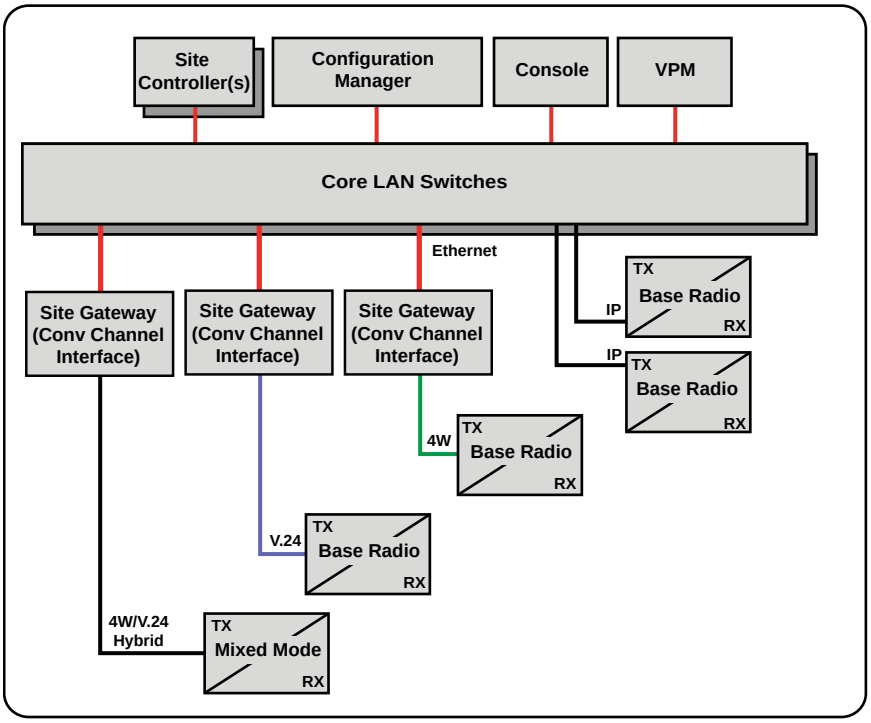


Figure 58: ASTRO 25 Conventional and Integrated Data System (K2)



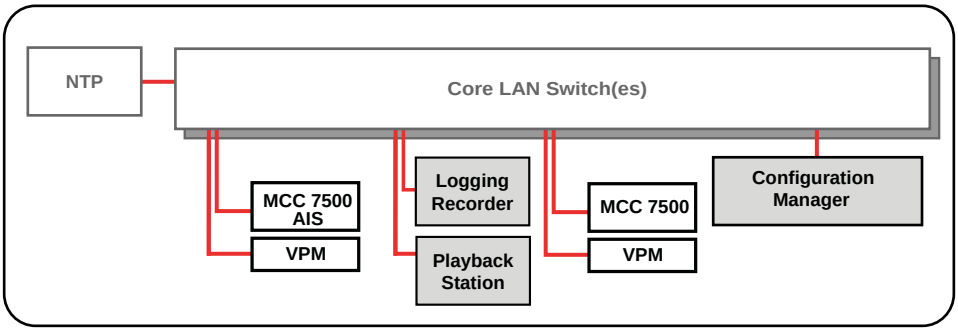
S_K2_config_F

Figure 59: ASTRO 25 System K Core with Colocated Console and Base Radios



K1_K2_Conv_MS_colocated_BRs_E

Figure 60: ASTRO 25 System K Core with Colocated Console and Audio Logging Subsystem



K1_K2_Conv_MS_Audio_Logging_Subsys_C